

BLACK STEM RUST OF WHEAT AND HOW BARBERRY SPREADS IT

How to build a Fence

Catalogue of
American Fence and Gates

January 1921

**American Steel & Wire
Company**

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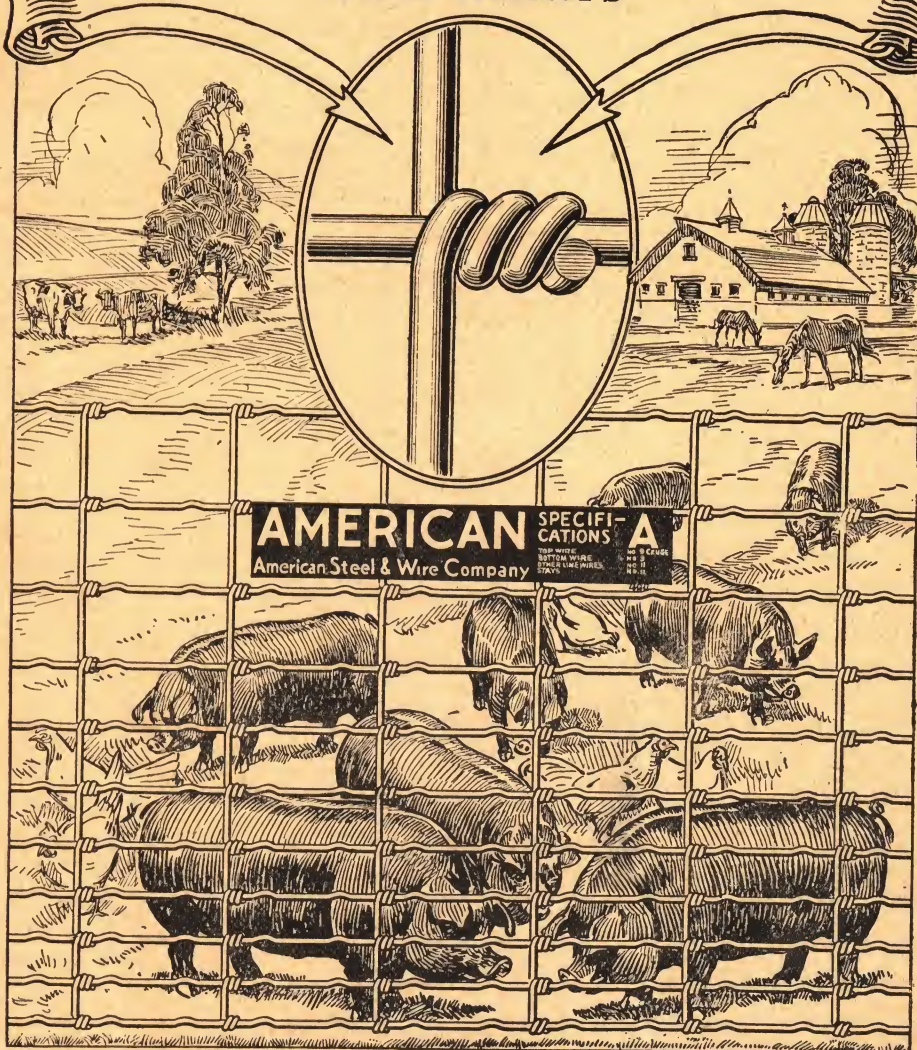
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The FAMOUS AMERICAN HINGE JOINT

Which Has Stood The Test
For 21 Years

and is now imitated by many
fence makers



STRENGTH-DURABILITY-FLEXIBILITY



Five Points to Consider in a Woven Wire Fence

1st— Size of Wire

The size or exactness of gauge of wires in a fence is a determining factor in the *cost*. Be sure you get the size of wires you are paying for. The wires in American Fence are *full gauge*.

2nd— Quality of Wire

Much is said about fence made of "Open Hearth" or "Bessemer" Steel. We use *both* in American Fence. It is the care used in the *manufacture* of the steel, which tells the tale. Don't be misled.

3rd— Quality of Gal- vanizing

To give greatest service the Galvanizing on a wire should be evenly applied and as thick as possible, and still avoid cracking and flaking off at splicing. The superiority of our Galvanizing has been proven for many years by the long service given by American Fence. Galvanizing on our Fence is applied by the most improved scientific methods.

4th— Method of Fasten- ing Stay Wires

The *hinge joint* or wrap on American Fence is fully described on next page.

5th— Spacing between Line and Stay Wires

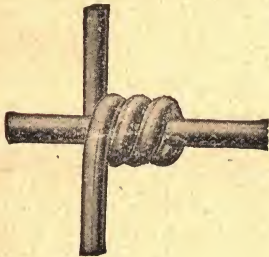
It is well to know that the spacing or *distance* between line and stay wires is as represented. You are assured of this in our American Fence. Every rod of 6-inch stay fence has 33 stay wires.





Method of Fastening Stay Wires to Line Wires

Various methods of fastening stay wires are in use, all of which possess some merit. The Hinge Joint and Tension Curve in American Fence have stood the test of time. The following cuts illustrate the fastening in detail:



Hinge Joint

(Showing front view)

Prevents fence crushing under pressure. See side views below.

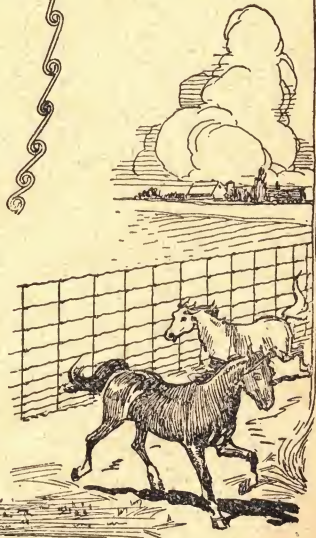
Cut on left shows stay wires in normal position, each section being a separate piece of wire completing the Hinge Joint.

Cut on right shows the action of stays under pressure, preventing the permanent bending of stays.

Tension Curve

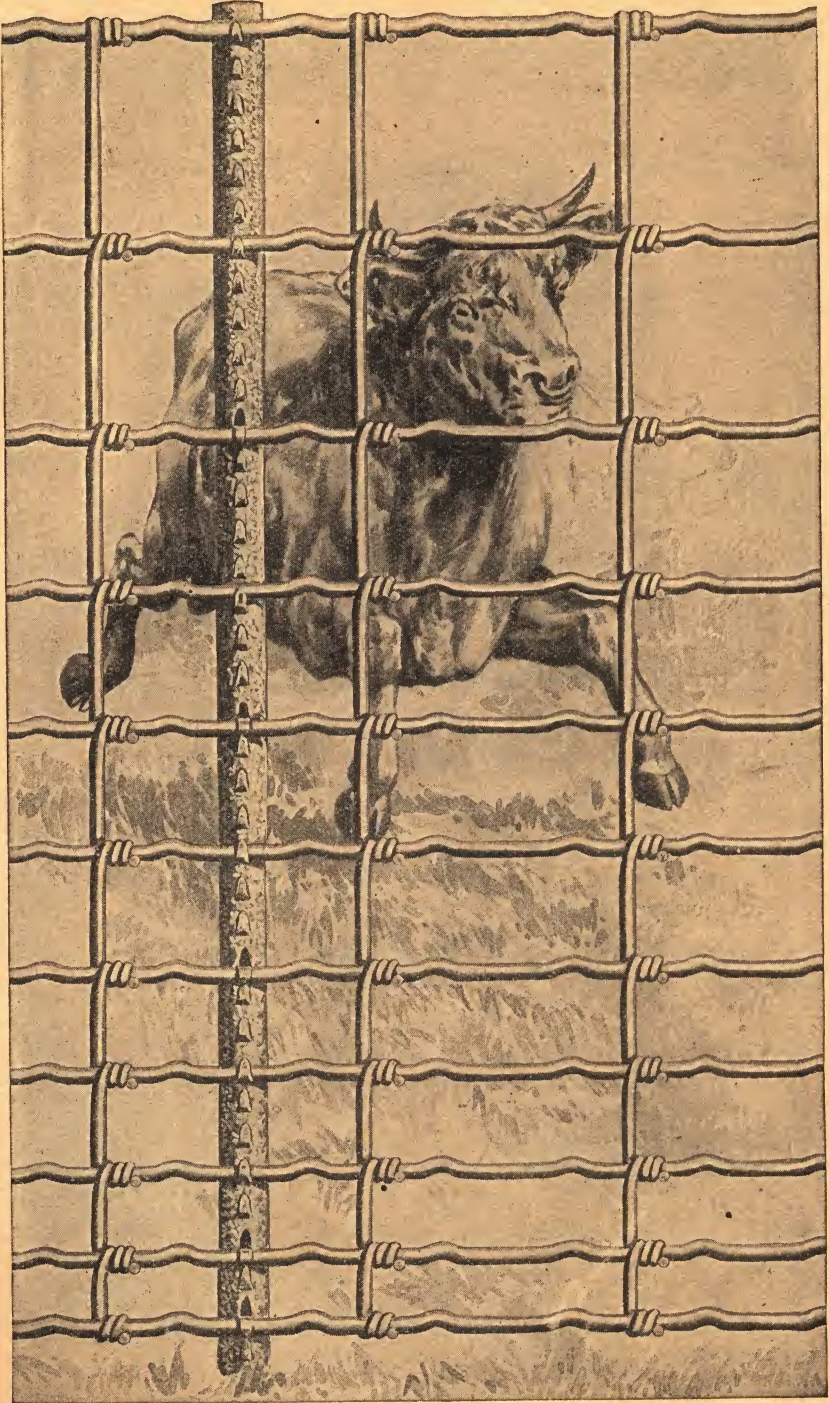


Provides ample allowance for contraction and expansion due to temperature changes.



American Fence

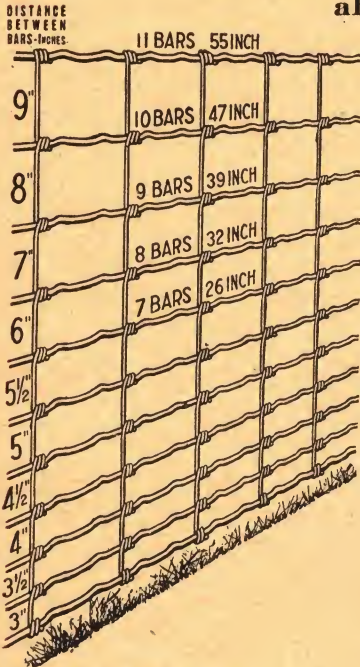
For Horses, Cattle, Sheep, Hogs and all Farm Animals



American Fence

Designs 1155, 1047, 939, 832, and 726

For Horses, Cattle, Sheep, Hogs and
all Farm Animals



The designs are made in three weights or specifications, with actual size of wires as follows:

ACTUAL SIZES OF WIRE					
	Spec. A		Spec. D		Spec. L
Top Bar....	9		9	10	
Bottom Bar.	9		9	10	
Intermediate Bars.....	11		9	12 1/2	
Stays.....	11		9	12 1/2	

(Directions for ordering American Fence shown on page 53)

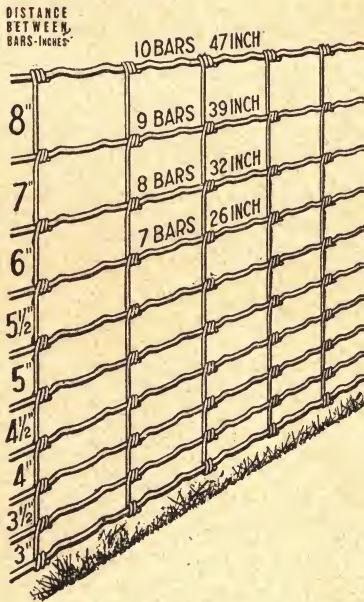
Specifica- tions	Design No.	No. of Horizontal Bars	Height in Inches	APPROXIMATE WEIGHT PER ROD IN POUNDS	
				12-inch Stays	6-inch Stays
A	1155	11	55	12.2	16.7
	1047	10	47	10.9	14.8
	939	9	39	9.7	13.1
	832	8	32	8.6	11.4
	726	7	26	7.5	9.8
D	1155	11	55	18.0	25.3
	1047	10	47	16.0	22.3
	939	9	39	14.1	19.6
	832	8	32	12.3	17.0
	726	7	26	10.6	14.5
L	1155	11	55	8.4	11.3
	1047	10	47	7.5	10.0
	939	9	39	6.7	8.9
	832	8	32	6.0	7.8
	726	7	26	5.3	6.8

Ask Your Dealer for Prices

American Fence

Specifications M

For Horses and Cattle





To meet the demand in some sections for a lighter weight Field Fence than our regular American Fences, we are making this new design called Specifications M. The spacing between the lateral and stay wires is the same as in the heavy and more expensive American Fence, and all the special structural features, such as hinge joint and tension curve will be found in this new design. We still believe in and advocate the heavier fabrics offered in our regular Field Fence Specifications, but in Specifications M you will find an ideal light weight, inexpensive field fence.



Made in 26, 32, 39 and 47 inch heights.

Stays 6 or 12 inches apart.

Furnished in 20, 30 and 40 rod rolls.

Sizes of Wires Used in Specifications M

Top Bar.....No. 11 
Bottom Bar.....No. 11 

Intermediate Bar. No. 14 
Stays.....No. 14 

Specifications M

(Directions for ordering American Fence shown on page 53)

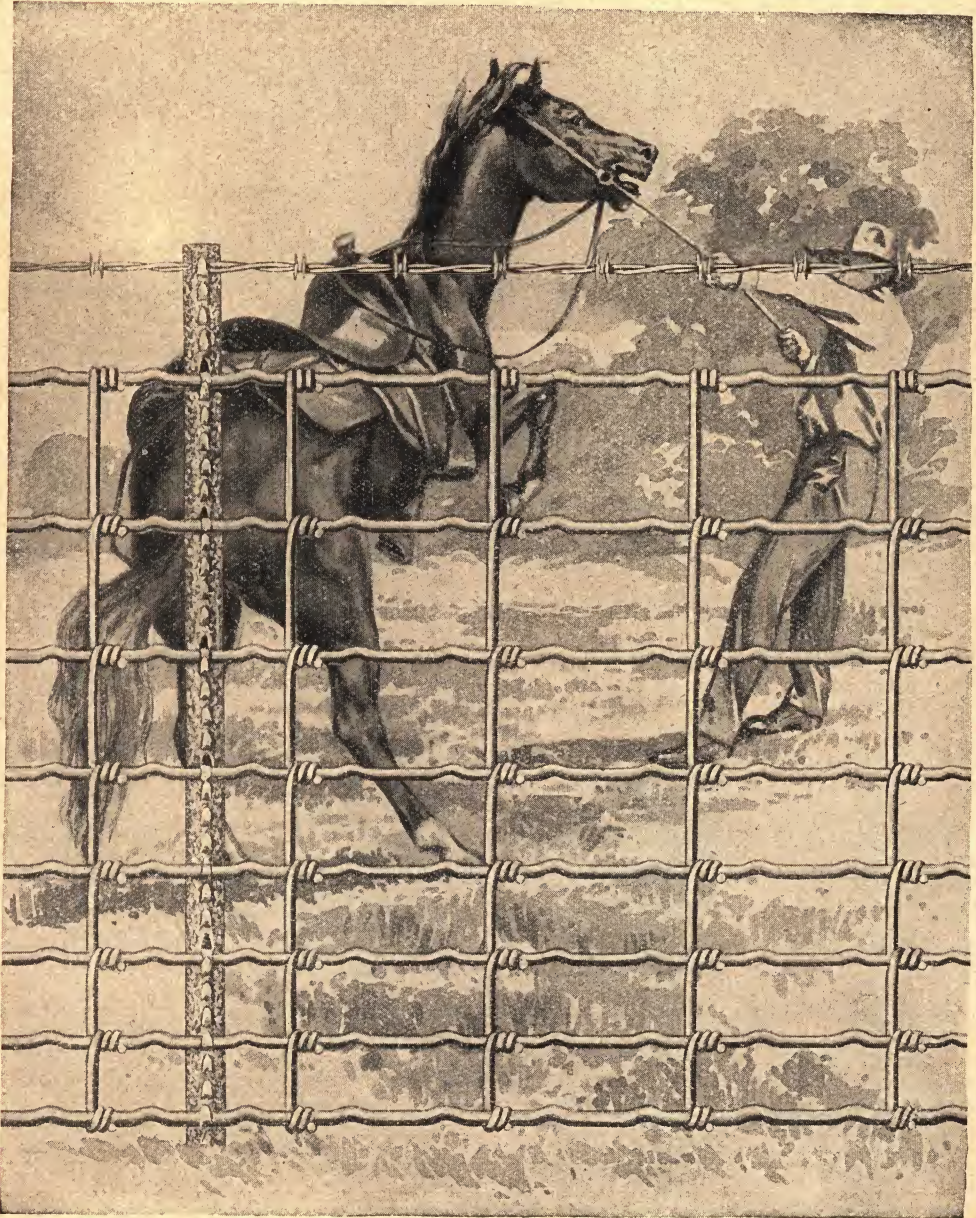
Design No.	No. of Horizontal Bars	Height in Inches	12-INCH STAYS		6-INCH STAYS	
			Approximate Weight per Rod, Pounds	List Prices per Rod	Approximate Weight per Rod, Pounds	List Prices per Rod
1047	10	47	5.2	\$0.70	6.7	\$0.93
939	9	39	4.7	.63	6.0	.83
832	8	32	4.2	.56	5.3	.73
726	7	26	3.7	.49	4.6	.64

Ask Your Dealer for Prices

American Fence

For Horses and Cattle

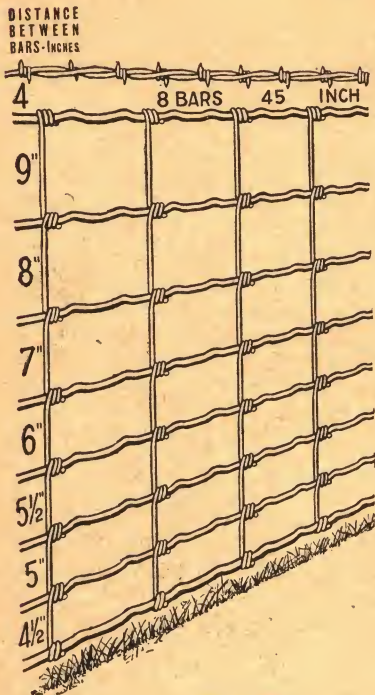
Design 845



American Fence

Design 845

For Horses and Cattle



With one strand of barbed wire stretched about 4 inches above the top bar of the fence, this design makes an excellent fence for turning horses and cattle.

Stay Wires 12 Inches Apart
Furnished in 40, 30, and 20 Rod Rolls

**Every Rod
Fully
Guaranteed**

Above design is made in three weights or specifications, with actual size of wires as follows:

	Specifications A	Specifications D	Specifications L
Top Bar.....No. 9		9	10
Bottom Bar.....No. 9		9	10
Intermediate Bars..No. 11		9	12 1/2
Stays.....No. 11		9	12 1/2

(Directions for ordering American Fence shown on page 53)

Specifications	Design No.	No. of Horizontal Bars	Height in Inches	12-INCH STAYS
				Approximate Weight per Rod in Pounds
A	845	8	45	9.3
D	845	8	45	13.4
L	845	8	45	6.4

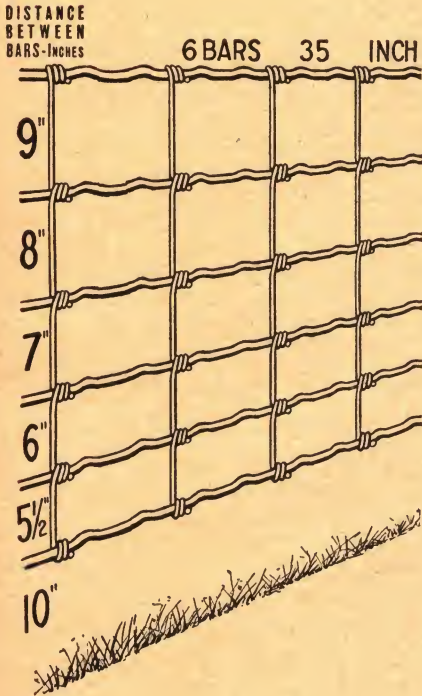
Ask Your Dealer for Prices

American Fence

Design 635

(Showing fence placed 10 inches above the ground)

For Horses and Cattle



This fence as shown in illustration, is usually placed 10 inches above the ground or can be placed on the ground if one or more strands of barbed wire are stretched on top. It is to be used for large animals only.

**Stay Wires 12 Inches Apart Only
Furnished in 40, 30, and 20 Rod Rolls**

Above design is made in three weights or specifications, with actual size of wires as follows:

	Specifications A	Specifications D	Specifications L
Top Bar.....No. 9		9	10
Bottom Bar.....No. 9		9	10
Intermediate Bars..No. 11		9	12 1/2
Stay Wires.....No. 11		9	12 1/2

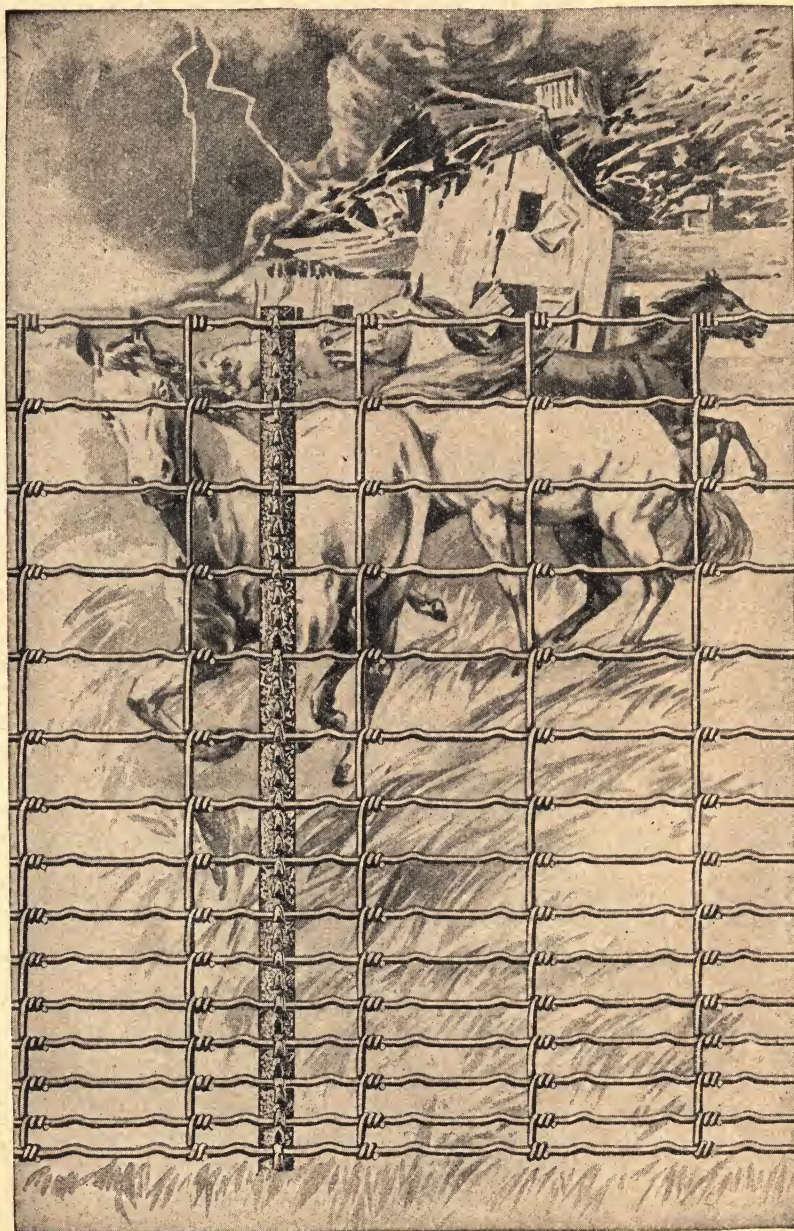
(Directions for ordering American Fence shown on page 53)

Specifications	Design No.	No. of Horizontal Bars	Height in Inches	12-INCH STAYS
				Approximate Weight per Rod in Pounds
A	635	6	35	7.2
D	635	6	35	10.2
L	635	6	35	5.1

Ask Your Dealer for Prices

American Fence

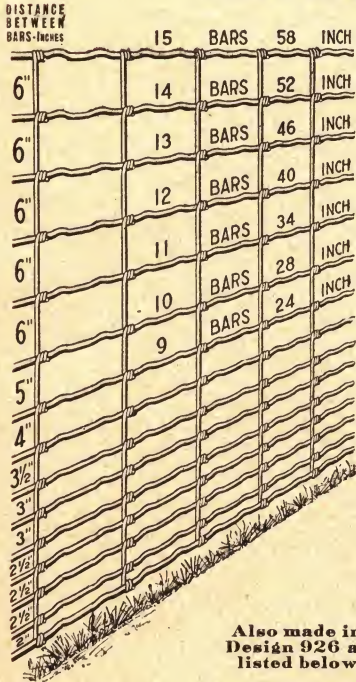
Close Mesh Hog and Cattle Fence



American Fence

Designs 1558, 1452, 1346, 1240, 1134, 1028, and 924

Close Mesh Hog and Cattle Fence





Also made in
Design 926 as
listed below



Also made in **Design 926**
9 Bars, 26 Inches High
Made Especially for the Southern Trade

Extensively used in the
Southern States for 20
years. Ideal for turning
razor-back hogs.

Stay Wires 6 or 12 Inches Apart
Furnished in 40, 30, and 20 Rod Rolls

Above designs are made in one weight with actual size of wire as follows:

Bottom Bar No. 10 
Top Bar No. 10 

Intermediate Bars . . No. 12 
Stays No. 13 

Specifications E

Design No.	No. of Horizontal Bars	Height in Inches	APPROXIMATE WEIGHT PER ROD IN POUNDS	
			12-inch Stays	6-inch Stays
1558	15	58	10.8	13.6
1452	14	52	10.0	12.6
1346	13	46	9.3	11.6
1240	12	40	8.5	10.6
1134	11	34	7.8	9.6
1028	10	28	7.1	8.6
926	9	26	6.4	7.9
924	9	24	6.3	7.7

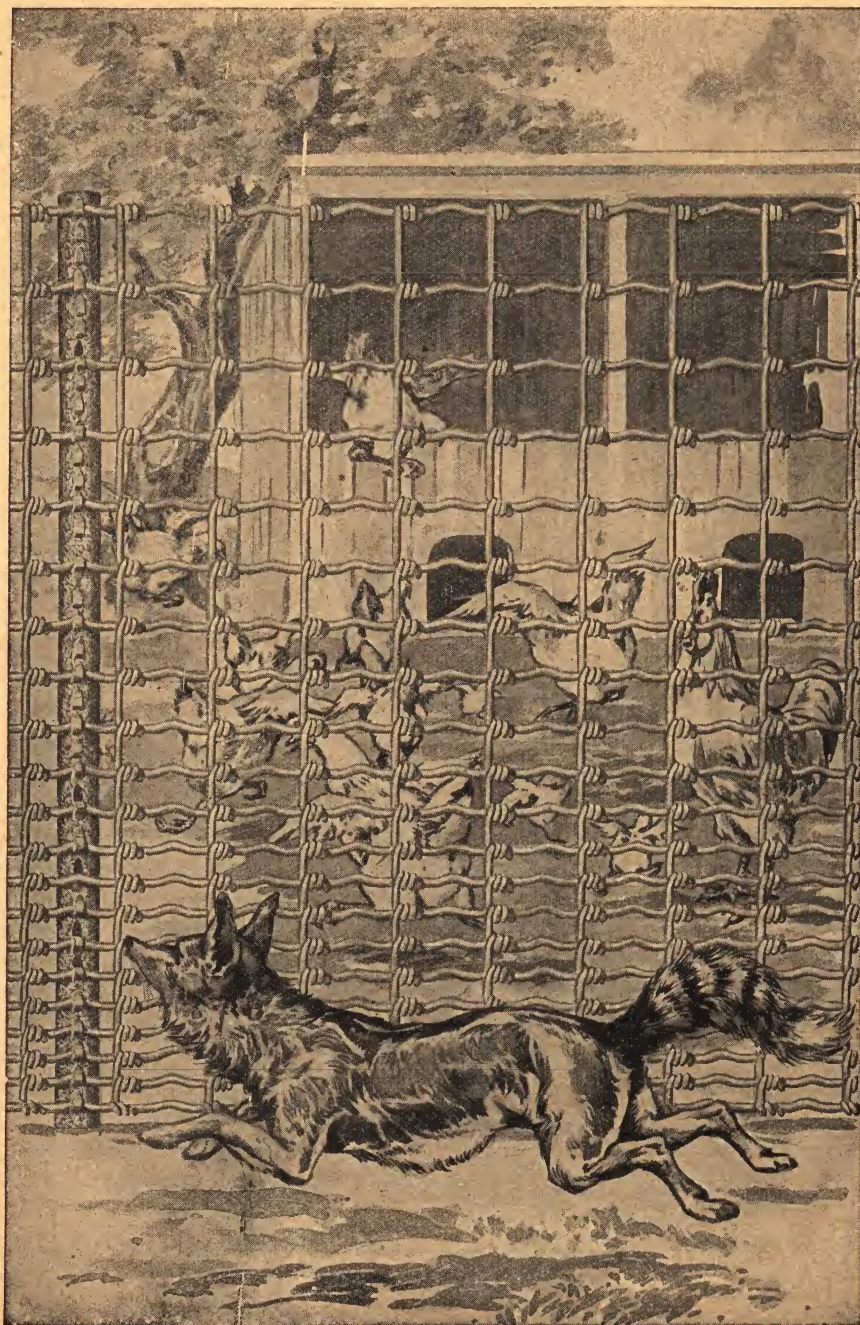
**When Buying a Hinge Joint Fence, Be Sure You Get the Genuine
AMERICAN FENCE**

Ask Your Dealer for Prices.

Directions for ordering American Fence shown on page 53.

American Fence

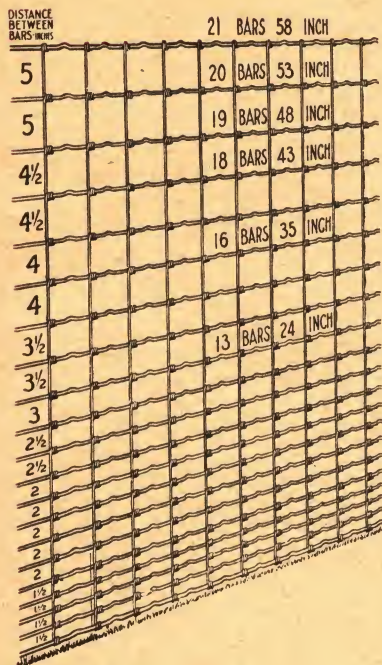
Poultry, Garden and Rabbit Fence



American Fence

Designs 2158, 2053, 1948, 1843, 1635, and 1324

Poultry, Garden and Rabbit Fence



Top or bottom boards not required with this Poultry Fence on account of the close spacing between bottom line wires. An ideal chicken and rabbit-proof fence.

**Stay Wires 6 Inches Apart
Furnished in 10, 20, and
30 Rod Rolls**

Above designs are made in one weight with actual size of wire as follows:

Top Wire.....No. 11



Intermediate Wires....No. 14



Bottom Wire.....No. 11



Stay Wires.....No. 14



Specifications F

Design No.	No. of Horizontal Bars	Height in Inches	APPROXIMATE WEIGHT PER ROD IN POUNDS
			6-inch Stays
2158	21	58	11.2
2053	20	53	10.6
1948	19	48	10.0
1843	18	43	9.4
1635	16	35	8.3
1324	13	24	6.7

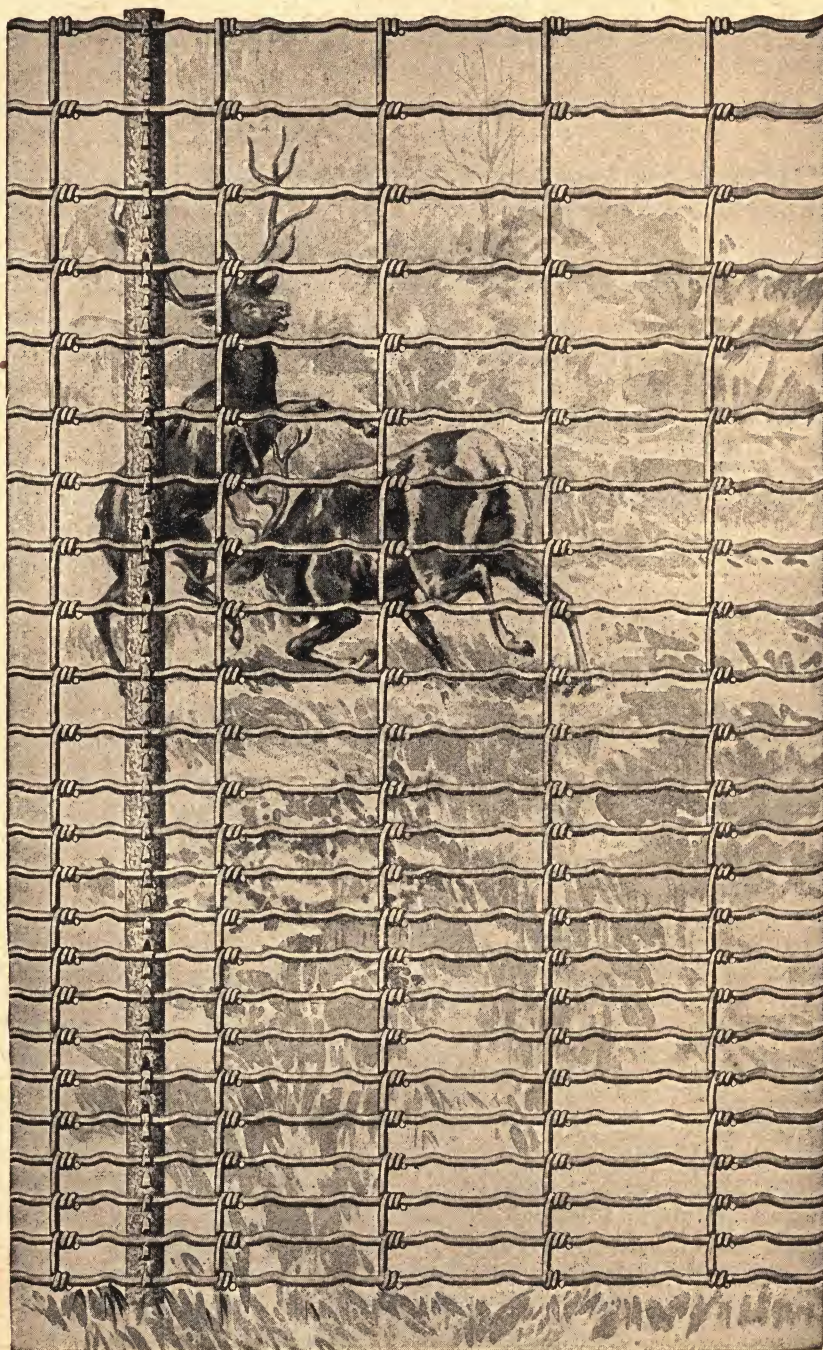
Full Gauge Wires—Full Weight—Full Length Rolls

AMERICAN FENCE

Ask Your Dealer for Prices

Directions for ordering American Fence shown on page 53.

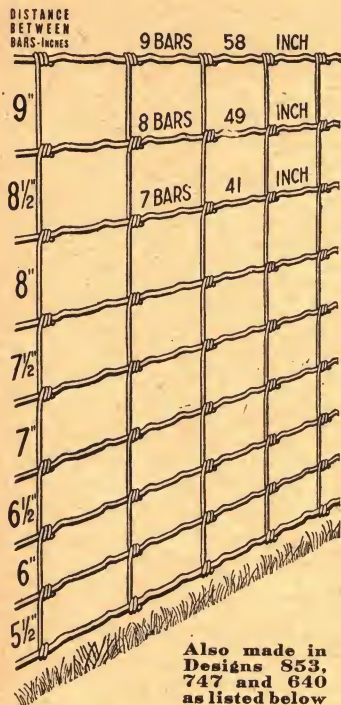
Park and Paddock Fence



American Fence

Designs 958, 849, and 741





Extra Heavy Fence for Large Animals



The wide spacing between line wires also stays 12 and 24 inches apart, permits the use of No. 7 gauge wire at relatively low cost. This style of fence is particularly adapted to horse and cattle yards, corrals, paddocks, branding pens, or pastures, where a fence of extraordinary strength is required.

Heaviest Wire Fence Made
Stay Wires 12 or 24 Inches Apart
***Furnished in 30 and 20 Rod Rolls**

Above designs are made in one weight, with actual size of wire as follows:

Top Bar.....No. 7		Intermediate Bar.....No. 7	
Bottom Bar.....No. 7		Stay Stays.....No. 7	

Specifications G

(This fence is made at Pittsburgh, Pa. only.)

*On account of its heavy weight, we recommend 20 rod rolls.

(Directions for ordering American Fence shown on page 53)

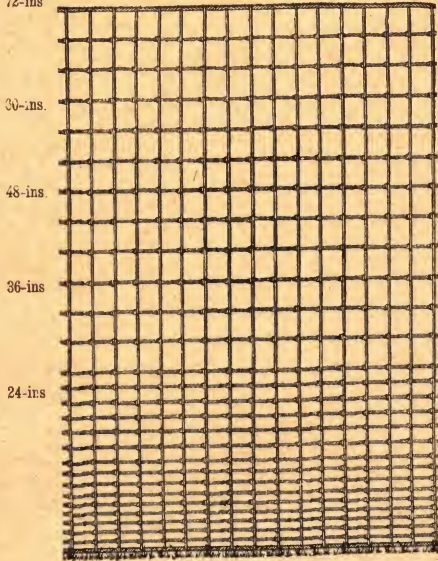
Design No.	No. of Horizontal Bars	Height in Inches	APPROXIMATE WEIGHT PER ROD IN POUNDS	
			24-Inch Stays	12-Inch Stays
958	9	58	17.8	23.2
853	8	53	15.9	20.7
849	8	49	15.7	20.3
747	7	47	13.9	18.2
741	7	41	13.6	17.5
640	6	40	12.0	15.6

Ask Your Dealer for Prices

Union Lock Poultry Fence

A Closely Spaced, Medium Weight, Square Mesh Poultry Fence
Thoroughly Galvanized

Heights
72-ins



SPECIFICATIONS L

Union Lock Poultry Fence has been on the market for years. The steadily increasing demand proves its superiority as an efficient, medium priced poultry fence. It is not to be confused with what is commonly known as a poultry *netting*. The latter is usually made from lighter wire, while Union Lock is a woven wire fence, made of heavier and well galvanized wire, which insures longer life. The first requirement of a good poultry fence is close spacing.

Union Lock Poultry Fence with its first six spaces only $1\frac{1}{8}$ inches apart, and gradually increasing to $3\frac{7}{8}$ inch spacing at the top, is a barrier to the smallest chicks.

All the horizontal bars consist of a two-strand cable.

Upright or stay wires are also closely spaced and woven into each cable to prevent slipping.

Being of square mesh construction, it goes up easily on uneven ground.

Can be stretched tightly, same as a stock fence.

Made in Five Heights Listed Below

Furnished in 10 and 20 Rod Rolls

Union Lock Poultry Fence offers exceptional value for a medium weight fence of its kind.

Heights and Weights

(Directions for ordering above fence, shown on page 53)

Specifications L

HORIZONTAL CABLES—Two-Strand No. 20 Gauge

STAY WIRES—No. 19 Gauge and 3 inches apart

Design No.	Number of Horizontal Bars	Height in Inches	Approximate Weight per 10 Rod Roll, in Pounds
2872	28	72	55
2560	25	60	48
2248	22	48	42
1936	19	36	35
1624	16	24	28

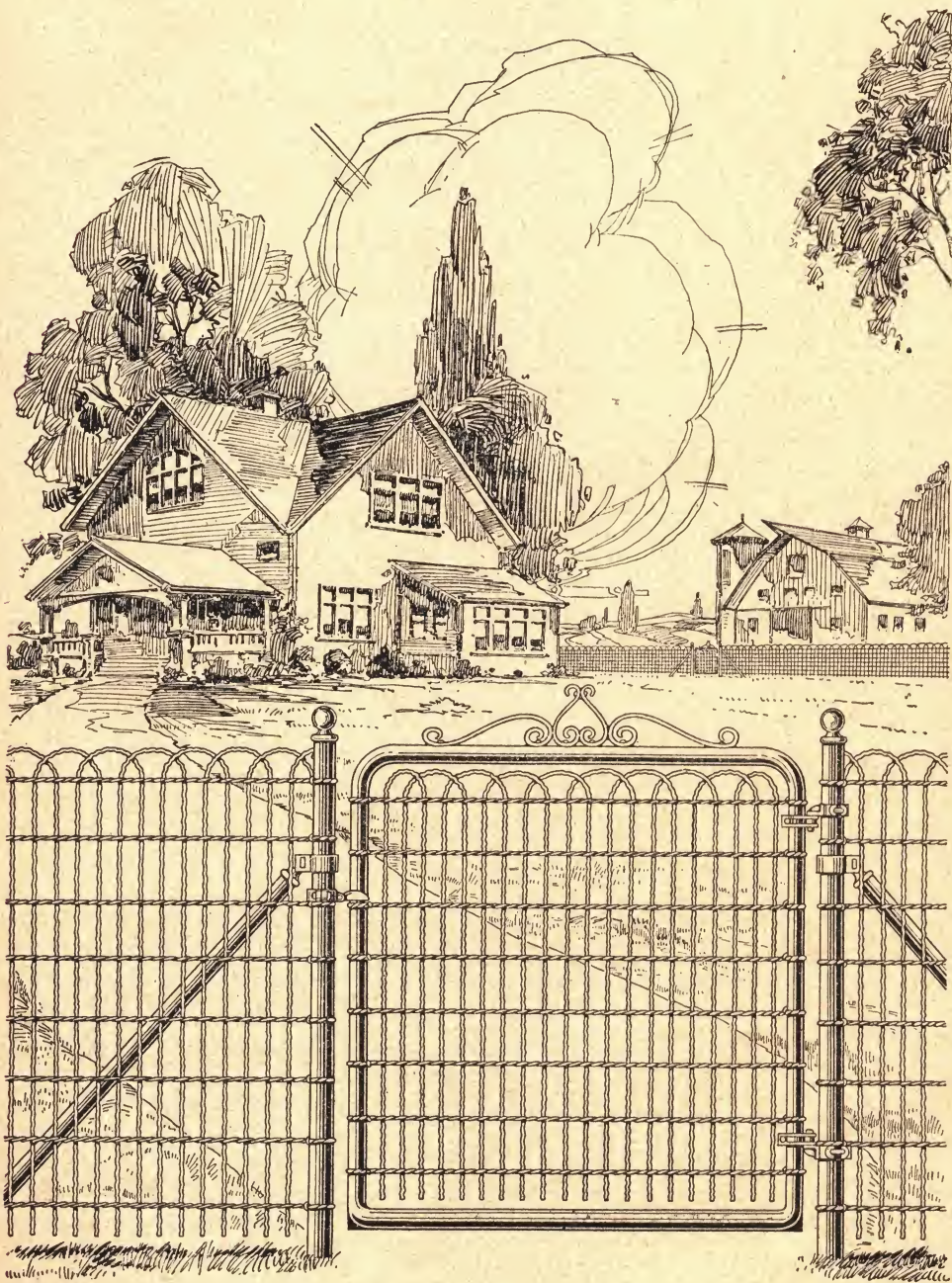
Light Weight
Close Mesh

UNION LOCK POULTRY FENCE

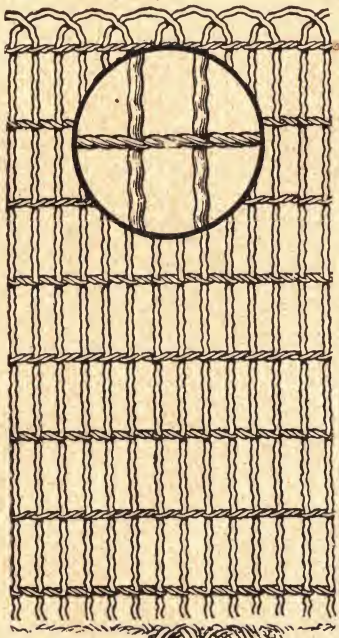
Ask Your Dealer for Prices.

Serviceable
Economical

American Lawn Fence



American Lawn Fence



American Lawn Fence belongs to the class of woven wire fences in which attractiveness is combined with usefulness, strength, and lasting quality. It is rapidly taking the place of wood fences for use around lawns, flower beds, front yards, and for division fences between residences. A few reasons why it is far superior to a wood fence:

Lasts longer, because it is not subject to decay.

Stronger, because it is made of heavy wires, thoroughly galvanized.

More sanitary, because it offers no breeding places for insects.

Cheaper, because it requires no repairing, painting, etc., from year to year.

Beneficial to the lawn or garden, because it provides for perfect ventilation and maximum amount of sunlight.

Its pickets are made of heavily galvanized No. 9 wire and are woven into a strong cable consisting of two strands of No. 12 wire. The crimp in the pickets increases strength and beauty of the fabric.

The close spacing between pickets not only makes it unclimbable, but keeps out smaller animals.

American Lawn Fence erected on galvanized steel posts, presents an all-steel combination which is unsurpassed and enhances the value of your property. Gates to match, shown on pages 18, 25 and 26.

Made in Four Heights and Two Styles.

Furnished in 150 Foot Rolls.

Size of wires as follows:

PICKETS:—No. 9 Galvanized Crimped Steel Wire.....

HORIZONTAL CABLES:—Two No. 12 Galvanized Steel Wires.....

ACTUAL SIZE



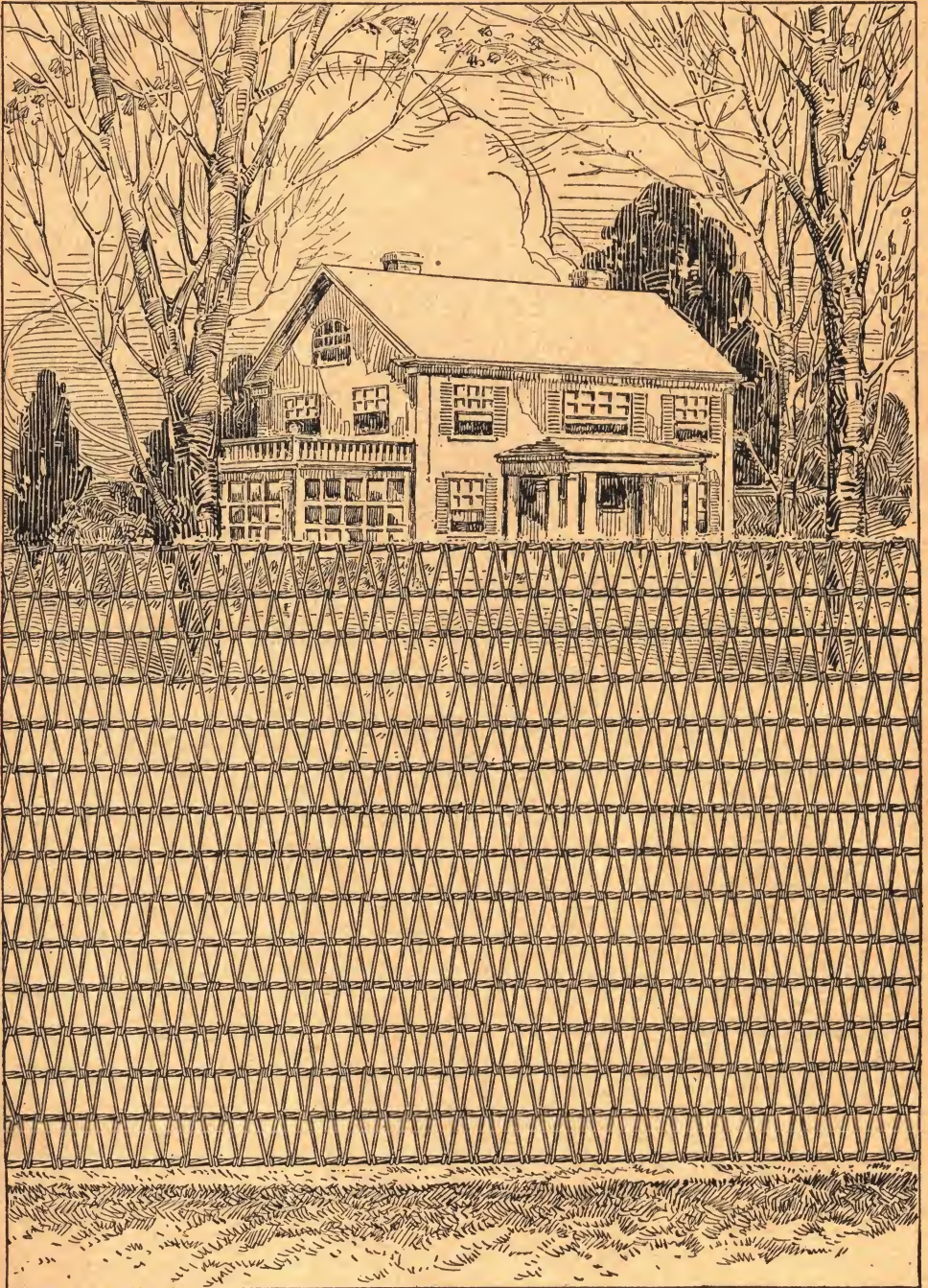
Heights and Weights

(Directions for ordering above fence, shown on page 53)

SPECIFICATIONS A Pickets 2¼ inches apart		SPECIFICATIONS B Pickets 1¾ inches apart	
Height in Inches	Approximate Weight per Roll	Height in Inches	Approximate Weight per Roll
51	270 pounds	51	333 pounds
42	220 pounds	42	286 pounds
37	203 pounds	37	252 pounds
24	140 pounds	24	166 pounds

Ask Your Dealer for Prices

Diamond Lawn Fence

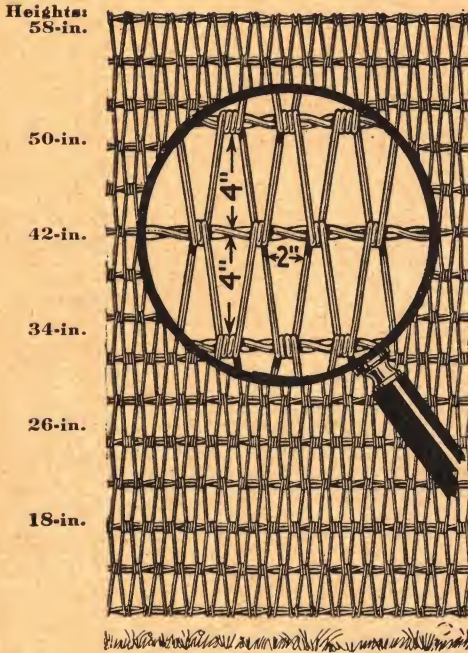


Diamond Lawn Fence

2-INCH MESH

Specifications I, J and K

(NON-CLIMBABLE)

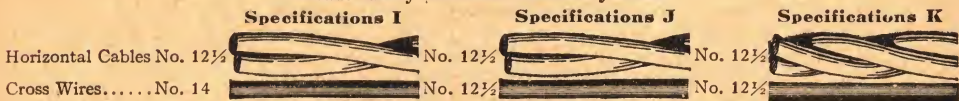


This fence is the same as that described on page 22 except that it has an opening between its cross wires of two inches instead of four inches. This makes it NON-CLIMBABLE, and suitable for a great many purposes where the 4-inch mesh would not be adequate. The closer spacing increases its strength and durability, enabling it to stand the heaviest usage, while still retaining its shape. Diamond Lawn Fence in the 2-inch mesh is extensively used around School Yards, Factories, Cemeteries, Tennis Courts, Golf Links, Fair Grounds, Race Tracks, Ball Parks, Orchards, and for many similar purposes. It is also largely

used for raisers of fancy cattle and horses, around pastures and corrals, because the mesh is so close that the stock cannot get their hoofs through the fence. When erected on galvanized steel posts it affords the best protection to the stock against loss of life by lightning. Gates to match above fence, shown on pages 23, 24, 29 and 30.

Made in Six Heights and Three Styles. Furnished in 10 and 20 Rod Rolls.

Actual size of wires and cables as follows:



Heights and Weights

(Directions for ordering above fence, shown on page 53)

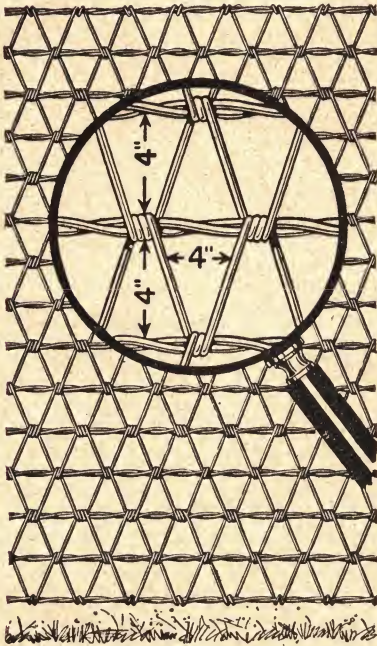
Height in Inches	Number of Horizontal Cables	Specifications I	Specifications J	Specifications K
		2-Strand No. 12 1/2 Cables No. 14 Cross Wires	2-Strand No. 12 1/2 Cables No. 12 1/2 Cross Wires	3-Strand No. 12 1/2 Cables No. 12 1/2 Cross Wires
		Approximate Weight per Rod in Pounds	Approximate Weight per Rod in Pounds	Approximate Weight per Rod in Pounds
58	15	29.4	38.3	44.6
50	13	25.3	32.9	38.4
42	11	21.2	27.6	32.2
34	9	17.2	22.2	26.0
26	7	13.1	16.9	19.8
18	5	9.0	11.5	13.6

Ask Your Dealer for Prices

Diamond Lawn Fence

4-INCH MESH

Specifications F



Diamond Lawn Fence is always in great demand, owing to the many purposes for which it can be utilized. The triangular truss is the strongest form of construction known. Its diagonal or cross wires are so interwoven with the horizontal cables that slipping is impossible. This gives the fence exceptional strength and rigidity. At every second cable the cross wires are wrapped *around* the cable, thus forming a perfect hinge joint. Under a heavy or sudden pressure the fence will act just like a hinge, and when the pressure is removed it can be bent back to its original position without injury to the wires.

Diamond Lawn Fence in the 4-inch mesh is especially adapted for Lawns, Gardens, Barnyards, Hay-mows, Grape Arbors, Trellises, Tree Guards, or any general purpose for which a fairly close meshed fabric is required.

Gates to match above fence, shown on pages 23, 24, 29 and 30.

Made in Six Heights Listed Below.

Furnished in 10 and 20 Rod Rolls.

Actual size of wires and cables as follows:

Horizontal Cables No. 12½  Cross Wires No. 14 

Heights and Weights

(Directions for ordering above fence, shown on page 53)

Specifications F

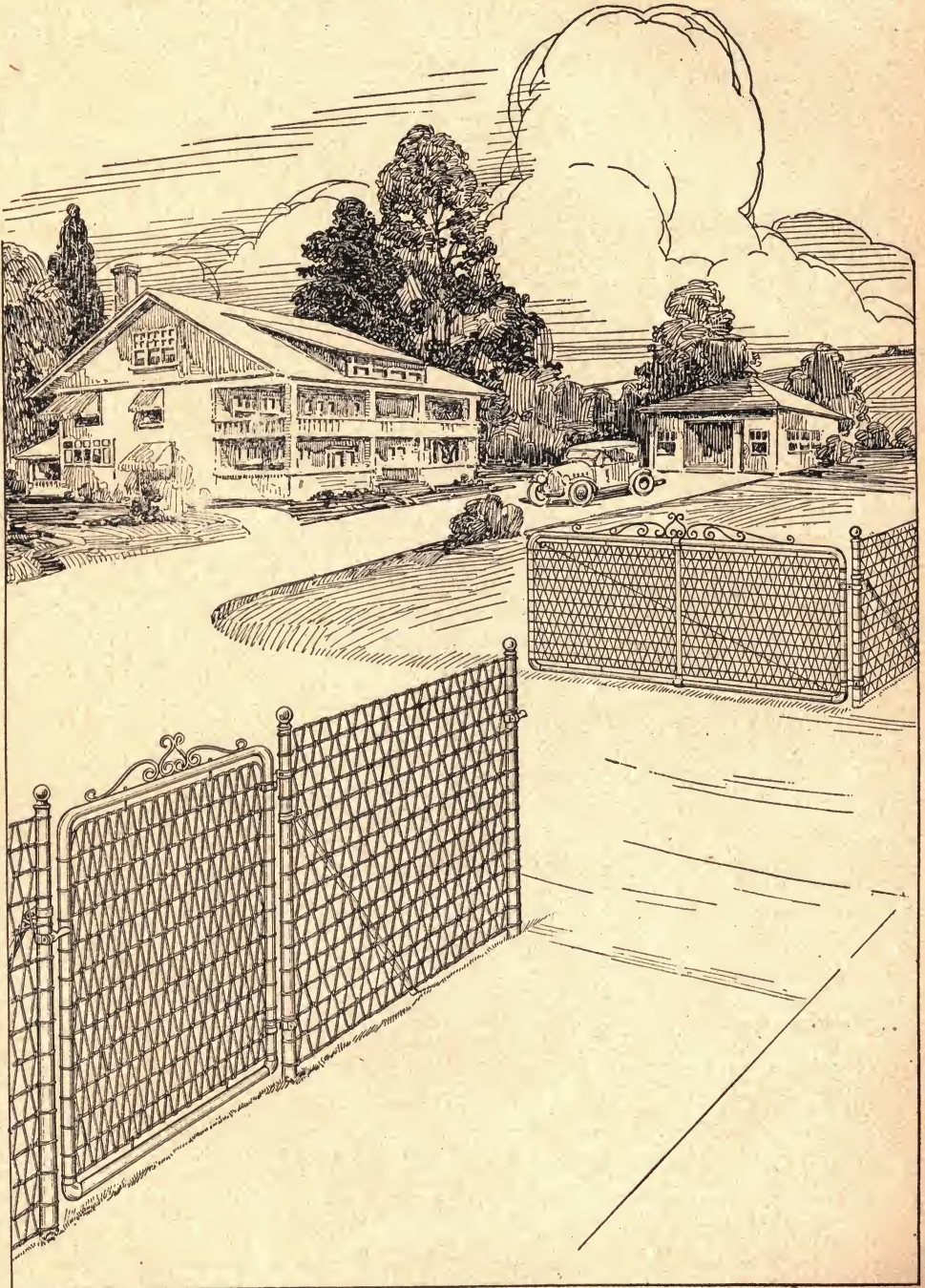
2-Strand No. 12½ Cables. No. 14 Cross Wires

Height in Inches	Number of Horizontal Cables	Approximate Weight per Rod, in Pounds
58	15	21.6
50	13	18.7
42	11	15.7
34	9	12.7
26	7	9.7
18	5	6.8

Ask Your Dealer for Prices

American Walk and Single Drive Gate Ornamental Top

Shown in Connection with Diamond Lawn Fence

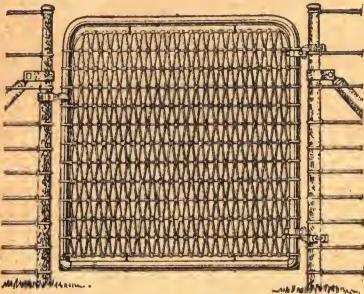


American Walk and Single Drive Gate

PLAIN AND ORNAMENTAL TOP

Furnished with Galvanized or Red Painted, Tubular Steel Frame

Filled with a 2-inch diamond mesh, heavily galvanized fabric, which is unclimbable.



Plain Top

A neat looking, durable Walk Gate always adds dignity to the appearance of a well kept farm or residence. Furthermore it protects the lawn or garden from the intrusion of smaller animals.

The steadily increasing demand for American Walk Gates (with their closely spaced, diamond mesh "filler" and strong frames) is a proof of their superiority. Their construction prevents children from getting a foothold in the gate and swinging on same.

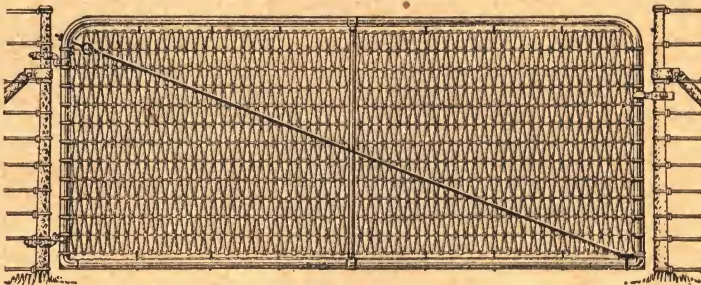
For use with 6 and 7-foot poultry fence we recommend the higher gate illustrated on page 29.

American Walk Gates come complete with latches and hinges for either wood or steel posts and are made to fit openings as given below.

Sizes and Weights

(Directions for ordering American Gates, shown on page 53)

Width of Opening	Height of Gate	Approximate Weight, Pounds
3 ft.	42 in.	19
3 ft.	50 in.	21
3 ft.	58 in.	23
4 ft.	42 in.	22
4 ft.	50 in.	24
4 ft.	58 in.	27



Plain Top

A strong, non-climbable, and economical farm gate. Universally recognized for its simplicity and durability. In addition to upright tubular brace, the frame is supported by a diagonal brace rod which keeps it firm and prevents sagging. Two upright braces in 14 and 16 foot gates; one brace in 10 and 12 foot gates.

American Single Drive Gates come complete with latches and hinges for either wood or steel posts and are made to fit openings as given below.

Sizes and Weights

(Directions for ordering American Gates, shown on page 53)

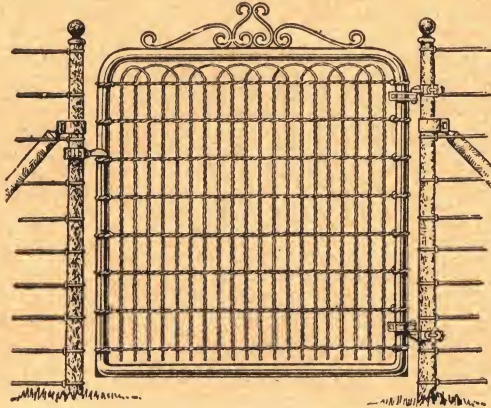
Width of Opening	Height of Gate	Approximate Weight Pounds
8 ft.	42 in.	53
8 ft.	50 in.	57
8 ft.	58 in.	63
10 ft.	42 in.	56
10 ft.	50 in.	61
10 ft.	58 in.	67
12 ft.	42 in.	65
12 ft.	50 in.	71
12 ft.	58 in.	77
14 ft.	42 in.	73
14 ft.	50 in.	80
14 ft.	58 in.	87

Ask Your Dealer for Prices

American Lawn Walk Gate

Furnished with Galvanized or Red Painted, Tubular Steel Frame

Filled with a heavily galvanized ornamental fabric. Pickets 1 $\frac{3}{4}$ inches apart.



Made with Ornamental Top Only

American Lawn Walk Gates are handsome, strong, and durable.

Especially designed for residences and when combined with American Lawn Fence, make a most pleasing and attractive appearance.

Pickets in the filler are made of heavily galvanized No. 9 crimped wire.

Horizontal cables are made up of two No. 12 galvanized wires.

Furnished in two widths and three heights.

Drive Gates to match, shown on page 26.

American Lawn Walk Gates come complete with latches and hinges for either wood or steel posts and are made to fit openings as given below.

American Lawn Fence to match above gates, shown on page 19.

Sizes and Weights

(Directions for ordering American Gates, shown on page 53)

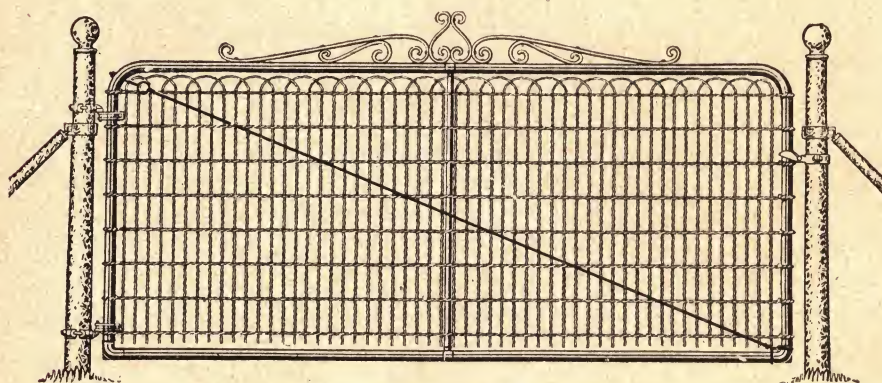
Width of Opening	Height of Gate	Approximate Weight, Pounds
3 ft.	37 in.	21
3 ft.	42 in.	22
3 ft.	51 in.	25

Ask Your Dealer for Prices

American Lawn Single Drive Gate

Furnished with Galvanized or Red Painted, Tubular Steel Frame

Filled with a heavily galvanized ornamental fabric. Pickets 1 $\frac{3}{4}$ inches apart.



Made with Ornamental Top Only

The American Lawn Single Drive Gate is artistic and durable. Well braced in the center by an upright tubular brace, and diagonally, by a brace rod which keeps the frame firm and prevents sagging. Two upright braces in 14 foot gate; one brace in 10 and 12 foot gates. Especially adapted for private driveways. When used in connection with American Lawn Fence it adds to the beauty of the surroundings and affords ample protection against intruders.

Pickets in the filler are made of heavily galvanized No. 9 crimped wire.

Horizontal cables are made up of two No. 12 galvanized wires.

Furnished in three widths and three heights.

Walk gates to match, shown on page 25.

American Lawn Single Drive Gates come complete with latches and hinges for either wood or steel posts and are made to fit openings as given below.

American Lawn Fence to match above gates, shown on page 19

Sizes and Weights

(Directions for ordering American Gates, shown on page 53)

Width of Opening	Height of Gate	Approximate Weight, Pounds
10 ft.	42 in.	56
10 ft.	50 in.	61
10 ft.	58 in.	67
12 ft.	42 in.	65
12 ft.	50 in.	71
12 ft.	58 in.	77
14 ft.	42 in.	73
14 ft.	50 in.	80
14 ft.	58 in.	87

Ask Your Dealer for Prices

American Tilting Gate

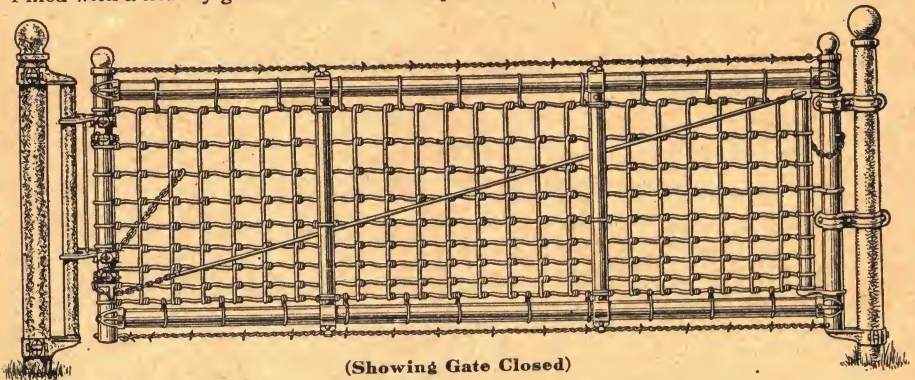
Showing Gate Tilted



American Tilting Gate

Furnished with Galvanized or Red Painted Tubular, Steel Frame

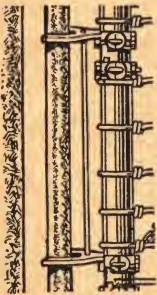
Filled with a heavily galvanized all No. 9 square mesh fabric. Stay wires 6 inches apart.



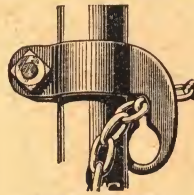
(Showing Gate Closed)

Our New American Tilting Gate offers the greatest value and most efficient service of any farm gate on the market.

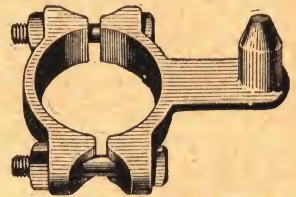
It is a combination tilting and lift gate which can be used in four different positions—*tilted, raised, tilted and raised, or closed*. It can be *tilted* at one end (23 to 36 inches) so that small stock may rotate from field to field, or the entire gate may be *raised* 12 inches, to swing clear of snow and ice.



Automatic Self-Closing Latch



Tilting Device



Foot Rest or Third Hinge

FRAME: Made of large *new* steel tubing—1.66 inches in diameter—which has *no open seams*. Tubing same size on all four sides.

BRACES: Large *tubular* braces add to strength of frame and keep the gate in shape. Two braces in 14 and 16 foot gates; one brace in 10 and 12 foot gates.

FABRIC: Heavily galvanized, square mesh fabric, or filler, made of full gauge No. 9 wire throughout. Upright or stay wires only 6 inches apart.

TIGHTENING DEVICE: Latest improved tightening device (consisting of three eye-bolts on hinge-end of gate) permits taking up any slack in the fabric, or filler, and keeping it perfectly tight.

TILTING DEVICE: Does away with heavy lifting. Gate can be raised with one hand to proper angle and locked from *either* side, by slipping a link of the chain into the slot (or lock-notch) provided for that purpose.

FOOT REST or THIRD HINGE: We furnish an extra or third hinge (known as a foot rest) the lug of which fits into the tubing at the bottom. This relieves the strain on the frame and permits the gate to swing more freely.

DOUBLE FORK LATCH: Automatic self-closing latch, made of heavy malleable iron—strong and durable. The long prong forks are connected by a vertical flat rod which causes both upper and lower latches to operate with one movement and being fastened to the gate itself are out of the way when gate is open.

BARBED WIRE AT TOP AND BOTTOM: Prevents stock from bearing down on top of gate, and hogs from rooting under it. Barbed wires can be easily removed if not desired.

Sizes and Weights

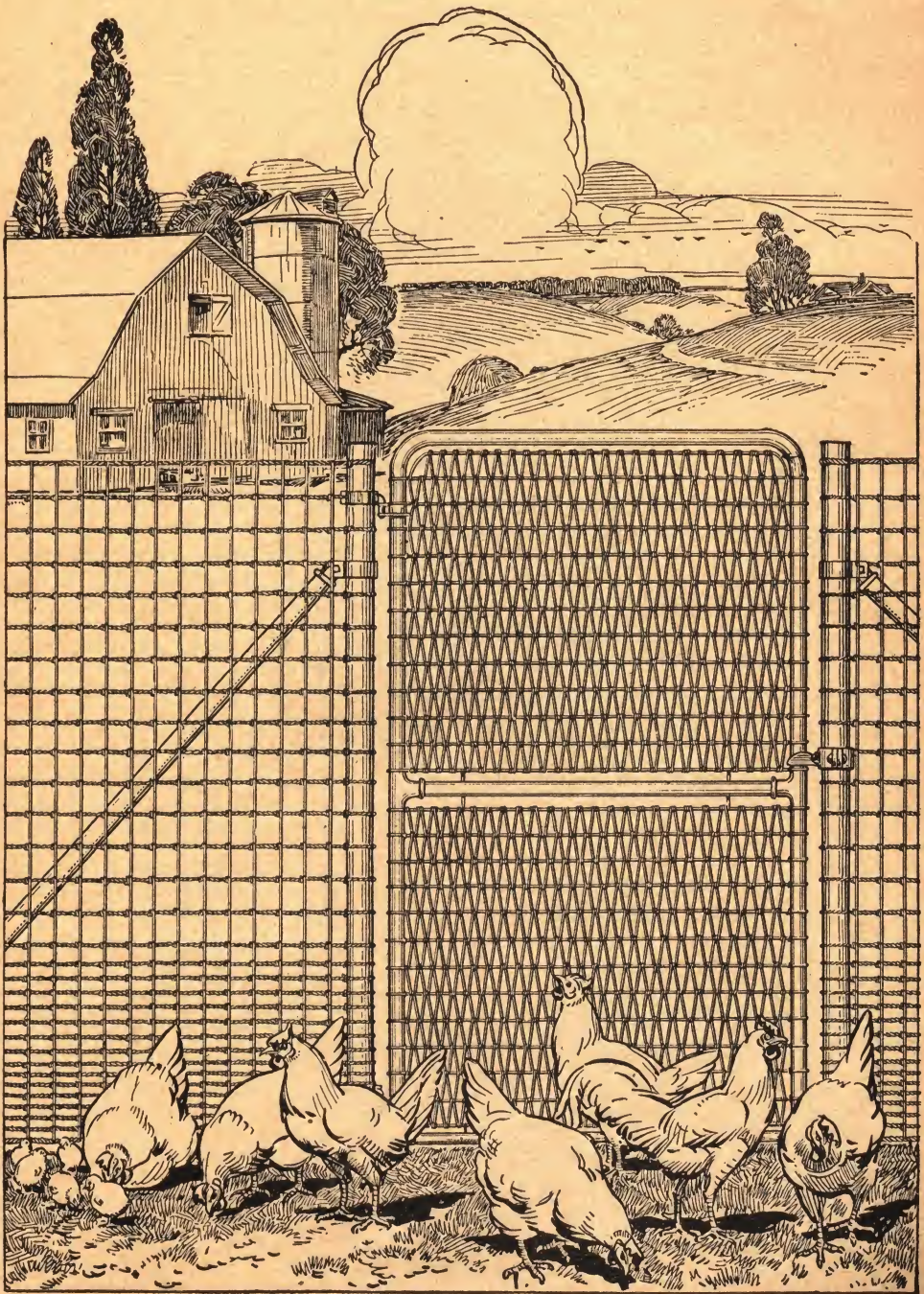
(Directions for ordering American Gates, shown on page 53)

Size of Gate	Height of Gate	Approximate Weight, Pounds	Size of Gate	Height of Gate	Approximate Weight, Pounds
10 ft.	50 in.	80	14 ft.	50 in.	98
10 ft.	55 in.	83	14 ft.	55 in.	100
12 ft.	50 in.	89	16 ft.	50 in.	109
12 ft.	55 in.	92	16 ft.	55 in.	113

Ask Your Dealer for Prices

American Poultry Yard Gate

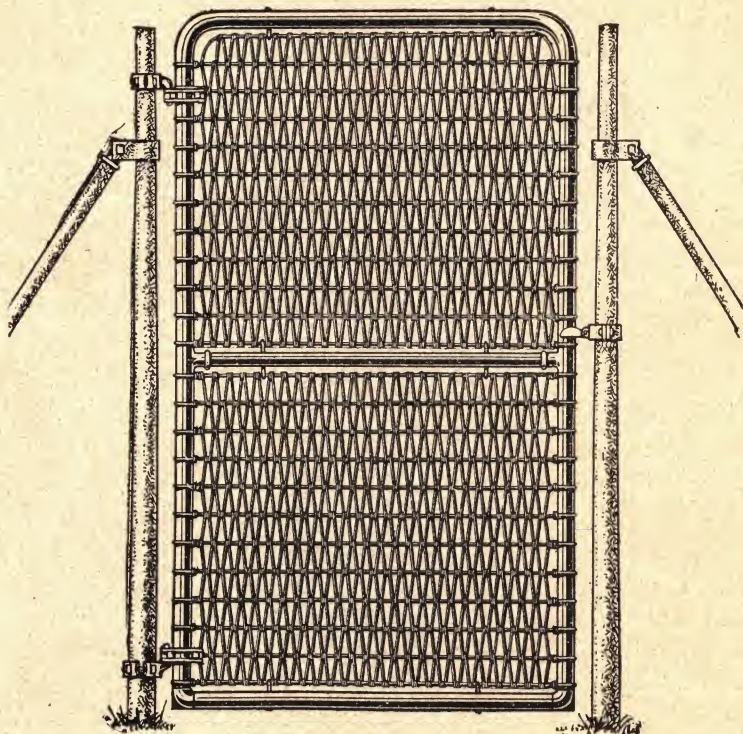
Shown in Connection with Union Lock Poultry Fence



American Poultry Yard Gate

Furnished with Galvanized, or Red Painted, Tubular Steel Frame

Filled with a 2-inch diamond mesh, heavily galvanized fabric, which is non-climbable.



Plain Top

The above gate with its close mesh fabric and strong horizontal brace, serves as an ideal barrier to fowl—large and small. Also facilitates entrance to a poultry yard.

It is principally used with 72 and 84-inch fence. Lower gates are shown on page 24.

American Poultry Yard Gates come complete with latches and hinges for either wood or steel posts and are made to fit openings as given below.

Sizes and Weights

(Directions for ordering American Gates, shown on page 53)

Width of Opening	Height of Gate	Approximate Weight Pounds
3 ft.	72 in.	32
3 ft.	84 in.	35

Ask Your Dealer for Prices

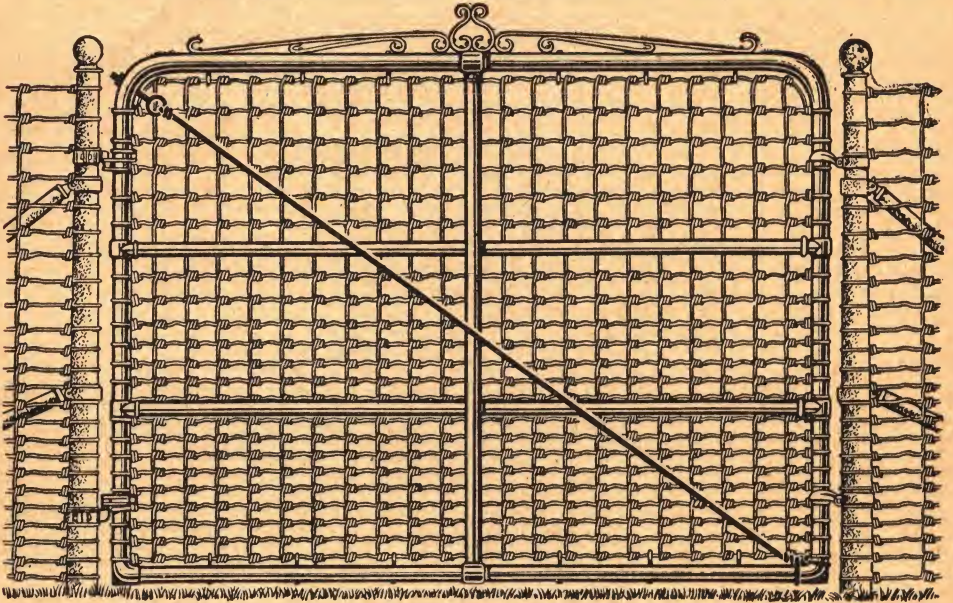
American Park and Paddock Gate



American Park and Paddock Gate

Furnished with Galvanized or Red Painted, Tubular Steel Frame

Filled with a heavily galvanized all No. 9 square mesh fabric. Stay wires 6 inches apart.



Made with Ornamental Top Only

Especially adapted for use in connection with Park and Paddock Fence around Private Parks, Zoölogical Gardens, and Fair Grounds, where a gate of Extra height, strength, and durability is required. See Park and Paddock Fence on page 15.

These gates are made in three widths and six popular heights.

Frames are made of large closed tubing and are braced with strong tubular braces—two horizontal and one vertical. In addition, the diagonal brace rod supports the frame and prevents sagging.

The filler is a heavy, square-mesh fabric, with stays 6 inches apart, all wires being No. 9 gauge and heavily galvanized.

American Park and Paddock Gates come complete with latches and hinges for either wood or steel posts and are made to fit openings as given below.

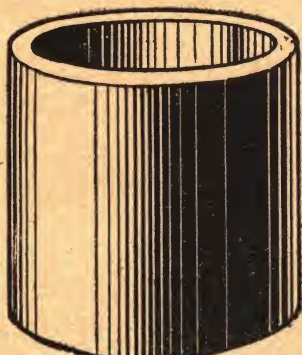
Sizes and Weights

(Directions for ordering American Gates, shown on page 53.)

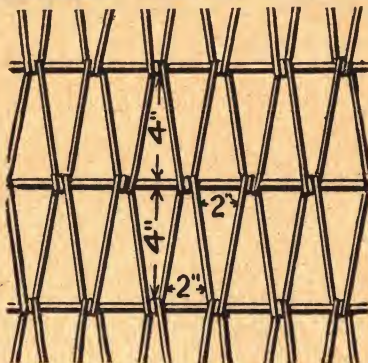
Width of Opening	Height of Gate	Approximate Weight, Pounds
10 ft.	65 in.	114
10 ft.	70 in.	117
10 ft.	75 in.	120
10 ft.	80 in.	123
10 ft.	86 in.	127
10 ft.	92 in.	130
12 ft.	65 in.	131
12 ft.	70 in.	134
12 ft.	75 in.	137
12 ft.	80 in.	140
12 ft.	86 in.	144
12 ft.	92 in.	148
14 ft.	65 in.	147
14 ft.	70 in.	151
14 ft.	75 in.	154
14 ft.	80 in.	158
14 ft.	86 in.	162
14 ft.	92 in.	165

Ask Your Dealer for Prices

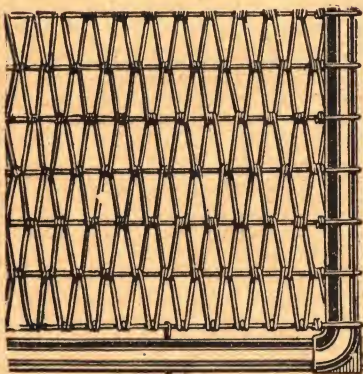
Quality Features Built Into American Tubular Steel Gates



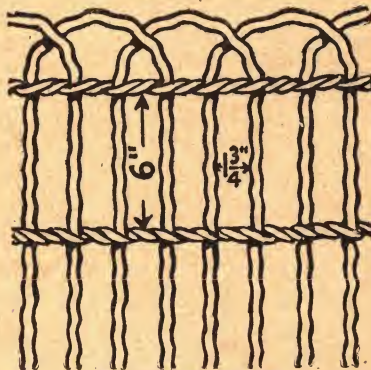
TUBULAR FRAMES
Made of Large New National Tubing.
Strength and Lightness Combined.
NO OPEN SEAMS



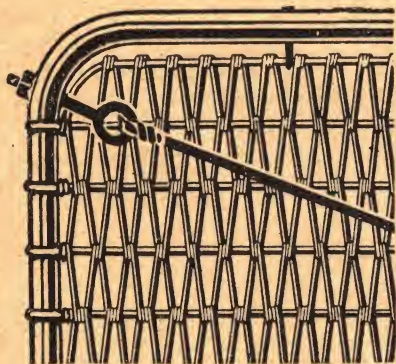
FABRIC OR FILLER
Used in American Walk, Poultry Yard, Single Drive and Double Drive Gates.
Lateral Wires No. 10; Cross Wires No. 12 1/2.
NON-CLIMBABLE



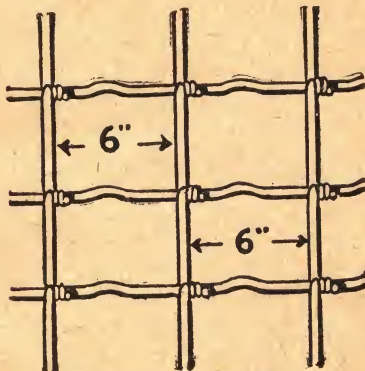
SQUARE CORNERS
At the Bottom of All American Gates
**CLOSING SPACE BETWEEN
GATE AND POSTS**



FABRIC OR FILLER
Used in American Lawn Gates.
Horizontal Cables, 2 ply No. 12. Pickets No. 9 Gauge.
ORNAMENTAL AND NON-CLIMBABLE



DIAGONAL BRACE ROD
Used in Single Drive and Park and Paddock Gates.
Gives Additional Support to Frame,
PREVENTS SAGGING



FABRIC OR FILLER
Used in American Tilting and American Park and Paddock Gates.
Full Gauge No. 9 Wire Throughout. Heavily Galv.
HOG-TIGHT SPACING

(Directions for ordering American Gates, shown on page 53)

Quality Features Built Into American Tubular Steel Gates

The five essential features which determine the efficiency, durability and value of a steel gate are as follows:

QUALITY OF THE FRAME

Much of the *strength* of a steel gate depends upon the *tubing* used in its frame; not only *size*, but *size and quality*. In the selection of *tubing* for our gate frames, we have carefully considered the stress and strain placed upon the various types of gates and the quality of steel necessary to combine *strength and durability* with *lightness in weight*. We use only *new* National steel tubing of a large diameter especially adapted for this purpose. This tubing has *no open seams*.

The frames in all our drive gates are further strengthened by large tubular *braces* which are neatly and securely fastened to the outer tubing.

Frames are furnished *Galvanized* or *Painted*, as desired. On our painted frames we use a red paint, the ingredients of which give it longer endurance and better wearing quality, than any other color. We recommend the *galvanized* frames because they last longer and look better than the painted frame, while only a trifle higher in price. In galvanizing our gate frames we use the *electro-galvanizing* process, leaving them under treatment long enough to secure a very thick and substantial coating. This enables them to withstand corrosion longer than any other gate on the market.

QUALITY OF THE FABRIC OR FILLER

Next in importance to a durable frame, is the *fabric* with which it is filled. A cheap, light weight *fabric* makes a poor gate, even though the *frame* may be substantial. Our gates are filled with a strong, heavily galvanized fabric, the size and spacing of which is properly proportioned according to the style of gate, and the purpose for which it is intended.

In American *Walk—Poultry Yard—Single Drive* Gates, we use a 2-inch diamond mesh fabric of truss form, in which the lateral wires are No. 10 gauge and diagonal wires No. 12½ gauge. This closely spaced "filler" proves a barrier to the smaller animals, adds strength to the gate, and makes it *undimble*. Thus the human tendency for children to swing on these gates, or for older folks to climb over them, is successfully overcome—it being impossible to secure a foothold in the "filler."

American *Lawn* Gates—both *Walk* and *Single Drive*—are filled with a cabled fabric of picket design, to match our American *Lawn Fence*. The pickets or upright wires, are No. 9 gauge, with horizontal cables consisting of two No. 12 gauge wires. Distance between pickets being only 1¼ inches, these gates also are *undimble*.

American *Tilting* Gates and American *Park and Paddock* Gates are filled with a heavily galvanized square mesh fabric, made of No. 9 gauge wire throughout. Spacing between the upright or stay wires being only 6 inches, makes these gates exceptionally strong and durable—which they should be, considering the purpose for which they are used.

DESIGN AND CONSTRUCTION

To secure the most efficient service out of a steel gate, it must be mechanically correct in its construction. American Gates are made with *square corners* at the bottom, thus effectually closing the space between the gate and the posts. The *tubing* is the same on all four sides and has no unsightly "joints" or "connections." The *frames* in all our large farm and drive gates, are braced with strong *tubular braces* and additionally supported by a large diagonal *brace rod* which keeps frame firm and prevents sagging. The *fabric* or *filler* is of the strongest construction. The *ornamental tops* are of neat design, and securely bolted to the frame. From every standpoint, American Gates are superior in design and construction, to other styles.

WORKMANSHIP

The *skilled labor* employed in our gate department and our *extensive equipment*, account for the *superior workmanship* which stands out prominently in every American Gate. Utmost care is used in shaping the *frame*, fastening the *filler*, attaching *ornamental tops*, etc. The *electro-galvanizing process* used on our galvanized frames, produces a perfectly smooth surface, which for lasting quality is unsurpassed.

(Directions for ordering American Gates, shown on page 53)

Proper Method of Hanging American Steel Gates on Galvanized Steel Posts

(See full directions on page 36)

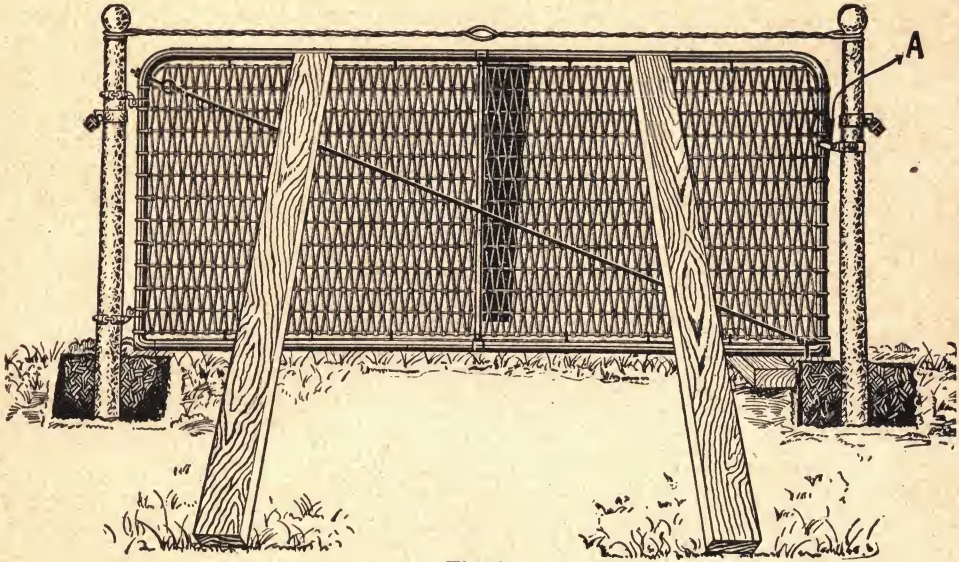


Fig. 1

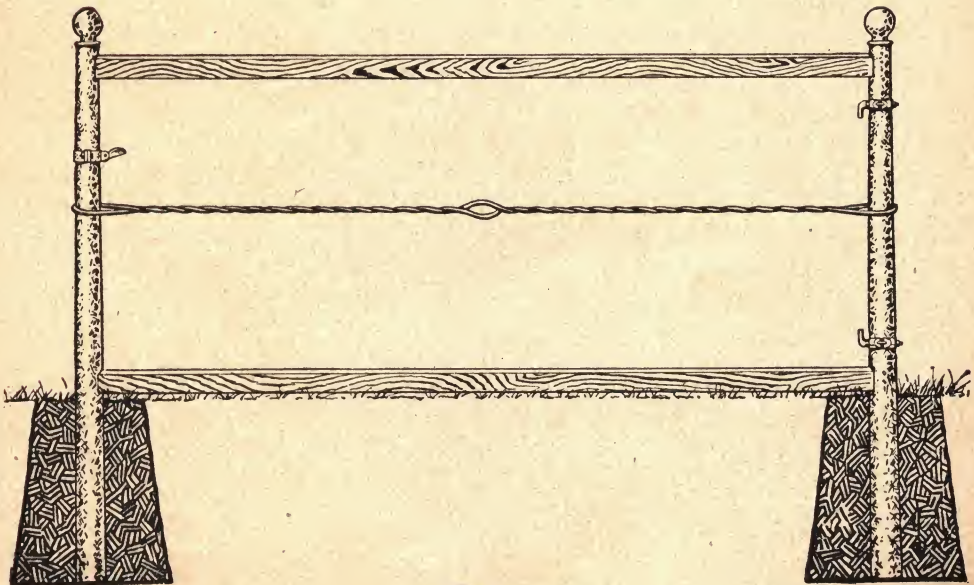


Fig. 2

Proper Method of Hanging American Steel Gates on Galvanized Steel Posts

(See illustrations on page 35)

The importance of good posts and proper setting of them should not be overlooked. Our Galvanized Steel Posts are the most effective and economical to use, time and experience having amply proved their durability and lasting quality. It pays to take time and pains to make sure the posts are properly set and braced so they will not move and that the gate works properly. On preceding pages we show distance to be allowed between posts.

Care must be exercised in getting the posts the proper distance apart and the same distance apart at the top as at the bottom. Hence, we suggest the following as a safe and satisfactory method of setting our Galvanized Steel Posts, between which gates are to be hung.

Ascertain from preceding pages the proper distance between posts for the style of gate to be used. Then dig the holes, the posts to go in the centers of the holes. Attach the hinge collars to one of the end posts and the latch to the other end post. Place the posts in the holes and hang the gate on the hinge hooks. Latch the gate and get the posts and the gate in just the position they should be, to work properly after the concrete is in.

To hold the gate and posts in position, braces can be used as indicated in illustrations on page 30. Put a block under the latch end of the gate to hold it up, as shown in Fig. 1. By stretching a wire between the tops of the posts, they will be prevented from spreading. At point marked "A" in Fig. 1, a small wedge should be inserted in the latch (between the ears) to prevent the gate from getting too far into the latch. The gate frame should strike at about the center of the latch ears.

After the posts and gate are in position just as you want them to remain, fill the post holes with concrete, being careful not to disturb the position of the posts. Then put in the braces and braceblocks and leave alone until the concrete is thoroughly hardened.

The method indicated in Fig. 2 is equally good. In this case, find from catalog or by actual measurement the proper distance between posts. Then cut two sticks of wood just the right length to hold the posts the proper distance apart, placing one piece between the posts and on the ground, and the other piece between the posts near the tops. Midway between the pieces of wood, pass a wire around the posts, and twist it to good tension. The wire will pull the posts toward each other and the sticks of wood will hold the posts the proper distance apart. See that the posts are perpendicular and fill the post holes with concrete. The braces and braceblocks can then be put in.

In both methods it is advisable to have the concrete block around the post, larger at the bottom than at the top—especially in light soil. For example, 18 by 20 inches at the top and about 22 by 24 inches at the bottom, by 3 feet deep. This will prevent the concrete block from coming out of the ground, when extreme pressure or tension is brought against the fence line.

American Steel Corn Cribs

Crib No. 50



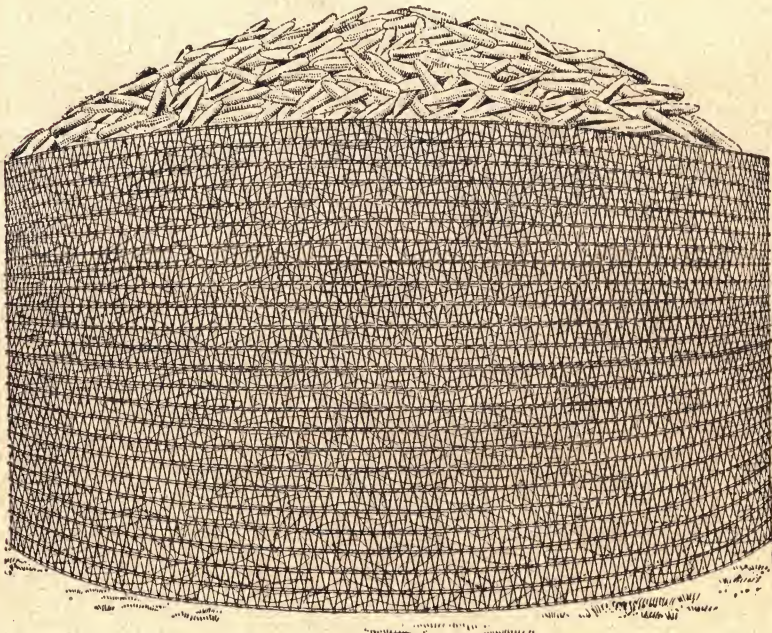
American Steel Corn Cribs

Made of Heavily Galvanized, Triangular Mesh, Wire Fabric
Two-Inch Spacing Between Cross Wires. Two-Strand Horizontal Cables
Furnished in Two Sizes

Crib No. 50

(As illustrated on opposite page)

Put up and shipped in rolls containing one piece or section. See illustration on page 39. By using two No. 50 Cribs, one above the other, an approximate capacity of 800 bushels is secured. This would also make the height when set up, 8 feet 4 inches.



Crib No. 75

Put up and shipped in rolls containing two pieces or sections. See illustration on page 39.

Sizes and Weights

(Directions for ordering Corn Cribs, shown on page 53)

Crib No.	No. of Pieces or Sections When Shipped	Height When Set Up	Approximate Diameter When Set Up	Approximate Capacity (Ear Corn)	Approximate Weight Per Crib
50	1	4 ft. 2 in.	15 ft. 6 in.	400 Bushels	77 pounds
75	2	8 ft. 4 in.	11 ft. 8 in.	400 Bushels	117 pounds

**Inexpensive
Durable**

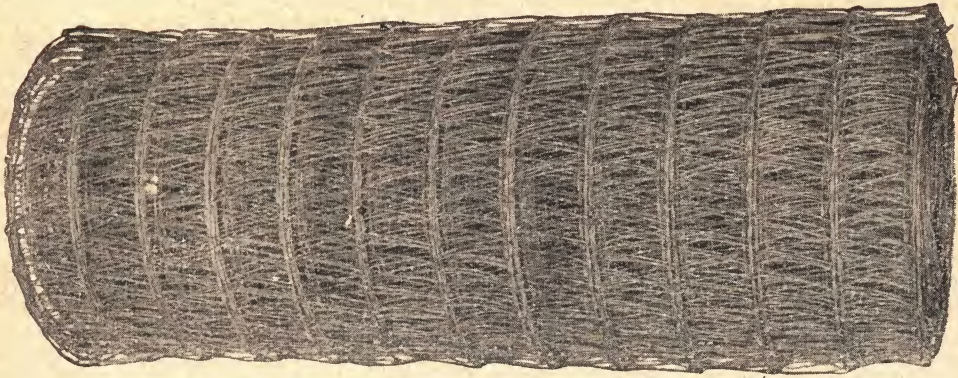
AMERICAN STEEL CORN CRIBS

**Easily Put Up
Easily Moved**

Ask Your Dealer for Prices.

American Steel Corn Cribs

Ready for Shipment



No. 50 Cribs are put up in one piece or section.

No. 75 Cribs are put up in two pieces or sections, of equal length, but packed together in one roll.

Several Important Reasons why American Steel Corn Cribs are Superior to Wooden Cribs:

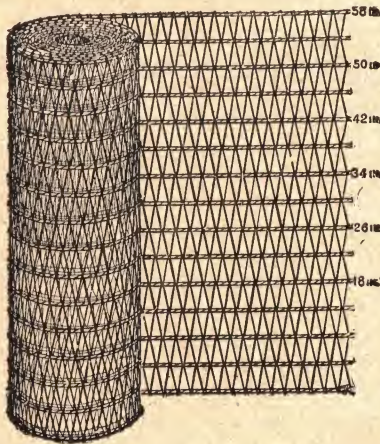
- Easy to build and easy to move.
- Last longer, being made entirely of galvanized steel.
- Fireproof and not subject to decay.
- Do not hold moisture.
- Provide for thorough ventilation.
- Do not shelter vermin or rodents.
- Stronger and more durable than wood or any combination of wood and wire.
- Inexpensive—in fact cost less than wood or other inferior cribbing.
- Two-inch mesh provides close spacing.
- Can be used as a chicken or yard fence when not in use as a crib.

American Steel Corn Cribbing

Made of Heavily Galvanized, Triangular Mesh, Wire Fabric

Two-Inch Spacing Between Cross Wires.
Made in Six Heights

Two-Strand Horizontal Cables
Furnished in 10, 20, and 30 Rod Rolls



Put up in rolls containing 10, 20 or 30 rods each, which can be cut up into different lengths according to the manner in which it is to be used. Especially adapted for *permanent* cribs where it is desirable to cover a wooden frame-work with a wire fabric.

A 30-rod roll of Corn Cribbing can be cut up, without waste, into five cribs of an approximate capacity of 700 or 800 bushels each. Six rods of 50 or 58-inch fabric being required for each crib. It is cheaper than wood and more durable.

Heights and Weights

(Directions for ordering Corn Cribbing, shown on page 53)

Height in Inches	Size of Mesh in Inches	Approximate Weight per Rod in Pounds
58	2x4	29.5
50	2x4	25.4
42	2x4	21.4
34	2x4	17.3
26	2x4	13.2
18	2x4	9.2

Cheaper
Than Wood

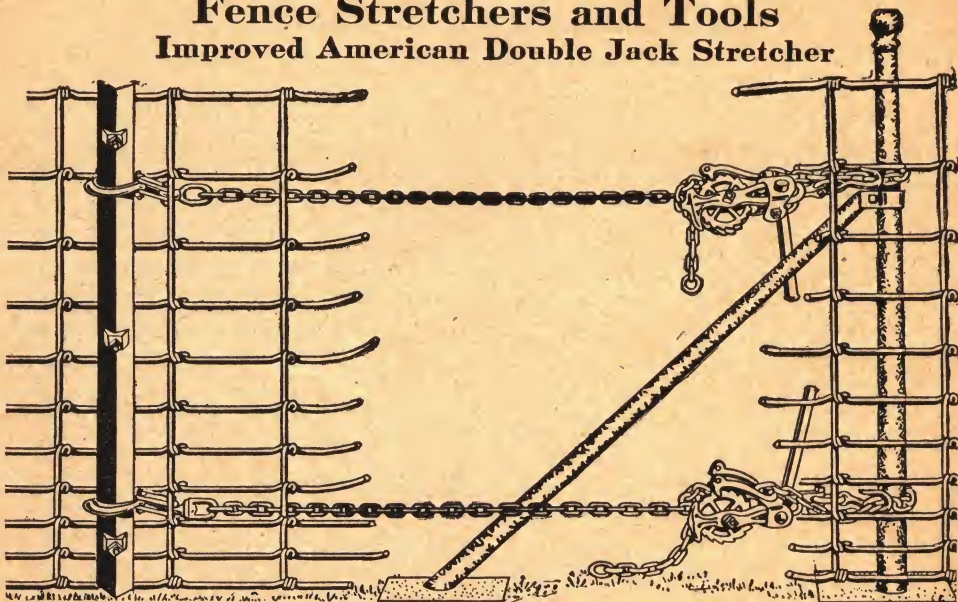
AMERICAN STEEL CORN CRIBBING

Ask Your Dealer for Prices.

Better
Ventilation

Fence Stretchers and Tools

Improved American Double Jack Stretcher



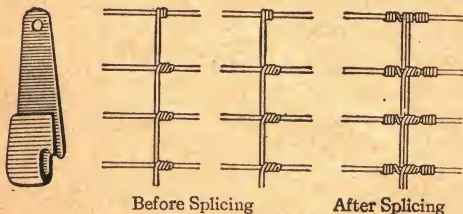
The American Double Jack Stretcher combines all the important features of a fence stretcher—Simplicity, Strength, and Safety. It is made entirely of steel, therefore, strong and durable. Its angle bars, or clamp bars, are rounded in such a way as to prevent injury to the wire during the stretching. Only three bolts on clamp bars—which can be easily and quickly tightened. It can be operated by one person. This stretcher consists of one pair of clamp bars, two jacks or stretching heads, two sets of chains and two levers, which makes it possible to stretch the fence at top or bottom, as desired. Shipping weight, approximately 105 lbs.

Lott Stretcher

Shipping weight, approximately 85 lbs.



Clamp bars furnished with Lott Stretchers are made of wood, reinforced with half-oval iron to keep wire from slipping. Stretching chain, 8 feet long. Stretcher furnished complete, except Lever. Use for this purpose an old piece of pipe or lever cut from wood.



American Splicer

Shipping weight approximately 3 lbs. per dozen.

Necessary and convenient for splicing wires in woven fence or elsewhere. Inexpensive and does the work well.

American Single Jack Stretcher

The American *Single Jack Stretcher* is identical, in construction, to the *Double Jack*, except that it has only *one* jack or stretching head, *one* set of chains and *one* lever. The *Single Jack Stretcher* is most generally used for lower or lighter fences. Shipping weight, approximately 82½ lbs.

A. S. & W. Single Wire Stretcher

(Patented)



For Use with Wood Posts

Shipping weight, approximately 8 lbs.

Used for tightening single wires (smooth or barbed), taking up slack, and making fence uniformly rigid. Works in any position. All metal; strong and durable.

Perfection American End Tool



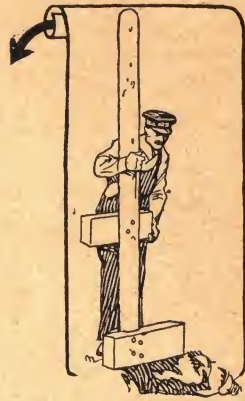
For Use with Steel Posts

A handy tool for fastening lateral wires of fence to steel end or corner posts. Insures uniform tightness, thus increasing life of fence. Easily operated. Shipping weight, about 3 lbs.

Fence Building With Wood Posts

End Post with Anchors

The first act in fence building is the setting of the end posts 4 to 4½ feet deep in a hole which has one side flat where the post will come flush with the flat side and lean against the solid earth. End posts have two anchors, spiked securely to each post, with 6-inch spikes, the top anchor placed so it will bear against the ground in the direction of fence pull, the bottom anchor (size, about 2 inches thick, 6 inches wide and 24 inches long) on the opposite side. Once set, the earth filling of the hole should be thoroughly tamped, to secure the greatest possible solidity.



Corner Post Anchors

A corner post, being subject to a tremendous pull from two directions, is supplied with three anchors. It is set in the hole 4 to 4½ feet deep, as is the end post, the top anchor and bottom anchor taking the fence pull in one direction while the third anchor, placed just under the top cross-piece but at right angles on the post, acts as a stiffener against the pulling power from the direction in which it is spiked.

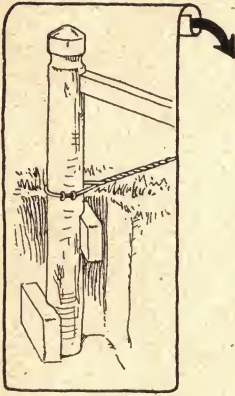


Post Anchors for Hollow Places

A bottom anchor on a line post is necessary where there is a hollow or depression in the ground along the fence line. This anchor is placed at the very lowest point on the post so that the fence shall not pull the post out of the ground.

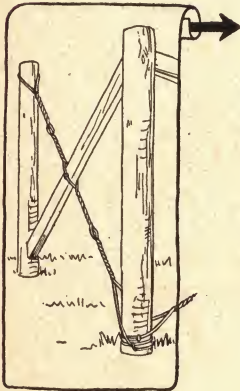


Wood and Wire Braces, End Post



End and second posts with necessary braces and anchors constitute the foundation of the fence. This is the end post with anchors at top and bottom, and also with the wood brace and wire brace to the second post, shown in their proper positions. The top anchor bears against the ground in the direction the fence is to be pulled, the bottom anchor on the opposite side of the post providing resistant leverage. The counter, or wire brace, No. 8 or larger soft galvanized wire, is wound and stapled at the bottom of the end post close to the ground.

Braces and Corner Post



Here we have the wood brace and the wire brace in complete installation on a corner post and the second posts.

The wire brace is stapled around the bottom of the end post and around the second post 6 inches from the top, using an A. S. & W. stretcher to draw the wire brace tightly. Then with a claw-hammer or other tool inserted between the wires midway between the posts and wood brace intersection, twist the wire brace until it becomes a hard and taut cable. This act is done both above and below the wood brace.



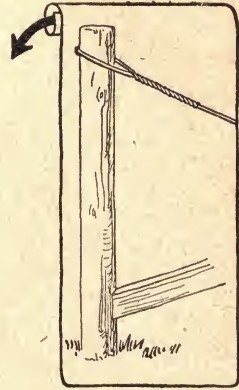
Stretching the Fence

As line posts do little work other than sustaining a part of the weight and holding the fence in position, they are spaced about 1 rod apart, being set 3 feet deep at least. Unroll enough fence to fasten around corner or end post, as desired, standing fence up against the post, large meshes on top and leaving enough to go clear around the post.

Wood and Wire Braces

Second Post

The second, or brace post, also anchored to secure a better job, is set 11 feet from the end post, so that a wood brace 4x4x12 can be placed diagonally, this brace being set flat against the post about 10 inches from the ground at the second post and the same distance from the top of the end post. The wire brace is attached or wound around the second post about 6 inches from its top.



Stretching the Fence

After getting the fence into position at the end or corner post, fasten each line wire around the post, wrapping the line around its own member. Then each line wire should be thoroughly stapled to the end post, staples being driven down firmly, contrary to the method for stapling line posts where staples are driven in lightly to permit line wires to work back and forth more or less freely.

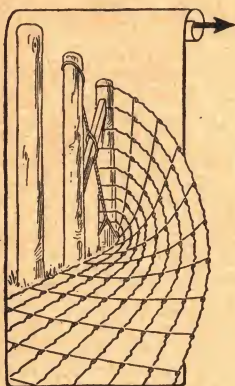


Splicing the Fence

The fence roll having been laid down to its end and when another roll is to be spliced, leave approximately 6 inches of wire from each stay at the end and splice it by wrapping the end of one wire around the corresponding wire of the second roll of fence, using the American Splicer.

In splicing one roll of fence to another, the wires having been wrapped around each corresponding wire, the splices will have the neat and strong appearance as shown in the illustration.





Unrolling the Fence

When the line wires have been wrapped and stapled around the end post, continue then to unroll the fence flat upon the ground along the line of posts as shown here.

Stretching the Fence



The splicing of the two rolls of fence having been completed, the fence builder proceeds to the end of the line, stretching the fence by hand as much as possible while it lies on the ground. The stretcher clamp bar then is attached, the large hook placed on the wooden clamp, open side of the hook facing the posts and in the center of the fence with equal number of line wires above and below. The stretcher is worked back and forth until the fence is thoroughly tight. It then will be found that the fence between the stretcher clamp bar and the end post needs to be taken up, and this is done with the hand A. S. & W. stretcher, each wire being taken up by itself.

The operator holds the stretcher with his body while driving the staples on the end post tightly.



By Use of Lott Stretcher

In using a stretcher, a Lott for instance, a long lever especially is desirable, because with it one man may accomplish as much as several men with a short lever. Note the lever length.

Following the driving of staples in end post after each single wire has been drawn tightly, each individual wire is brought around the post, fastening and twisting the wire to the corresponding member of the fence.

Standard Nail Card

Adopted August, 1920

Extras on Standard Wire Nails in Kegs

Common Wire Nails	Common Brads	Barbed Roofing Nails	Clinch Nails Bright	Sterilized Blued Lath Nails
2d \$1.45	2d \$1.50	Regular Head	2d \$1.55	2d \$2.20
3d 1.15	3d 1.20	3/4-inch \$1.55	3d 1.15	2d Light... 2.20
4d ..... .80	4d ..... .85	7/8-inch 1.30	4d ..... .95	3d 1.60
5d ..... .75	5d ..... .80	1-inch 1.20	5d ..... .90	3d Light... 1.80
6d ..... .60	6d ..... .65	1 1/8-inch 1.10	6d ..... .75	
7d ..... .55	7d ..... .60	1 1/4-inch ..... .95	7d ..... .70	Barrel Nails
8d ..... .30	8d ..... .35	1 3/8-inch ..... .90	8d ..... .55	5/8-inch \$2.25
9d ..... .30	9d ..... .35	1 1/2-inch ..... .80	9d ..... .55	3/4-inch 1.90
10d ..... .20	10d ..... .25	1 3/4-inch ..... .75	10d ..... .45	7/8-inch 1.55
12d ..... .15	12d ..... .20	2-inch ..... .65	12d ..... .40	1-inch 1.45
16d ..... .10	16d ..... .15		16d ..... .35	1 1/8-inch 1.35
20d-60d Base	20d-60d ..... .05	Fence Nails	20d ..... .30	1 1/4-inch 1.15
		5d \$0.50		1 3/8-inch ..... .85
Casing Nails		6d ..... .45		1 1/2-inch ..... .80
2d \$1.70		7d ..... .35	Barbed Car Nails	
3d 1.35	Shingle Nails	8d ..... .25	Bright	Barbed Dowel Pins
4d 1.10	3d \$0.90	9d ..... .25	Light Heavy	No. 8 Gauge
5d 1.05	3 1/2 d ..... .75	10d ..... .20	4d \$0.95 \$0.80	5/8-inch \$1.75
6d ..... .75	4d ..... .70	12d ..... .10	5d ..... .75 .70	3/4-inch 1.50
7d ..... .70		16d ..... .05	6d ..... .70 .65	1-inch 1.35
8d ..... .50	Smooth Box Nails	20d Base	7d ..... .60 .60	1 1/8-inch 1.25
9d ..... .50		Hinge Nails	8d ..... .50 .50	1 1/4-inch 1.15
10d ..... .35		Bright Light Heavy	9d ..... .50 .50	1 3/8-inch 1.10
12d ..... .30	2d \$1.65	4d \$1.00 \$0.95	10d ..... .45 .45	1 1/2-inch 1.05
16d ..... .20	3d 1.30	6d ..... .90 .85	12d ..... .40 .35	1 3/4-inch 1.00
20d-40d ..... .10	4d 1.05	8d ..... .75 .70	16d ..... .35 .25	
	5d 1.00	10d ..... .65 .65	20d-60d .25 .25	Berry Box Nails
Finishing Nails	6d ..... .70	12d ..... .60 .60		Smooth
2d \$2.00	7d ..... .65	16d ..... .55 .55	Annealed	No. 16 No. 17
3d 1.55	8d ..... .45	20d ..... .50 .50	Light Heavy	
4d 1.25	9d ..... .45		4d \$1.20 \$1.05	3/4-in. \$1.90 \$2.20
5d 1.20	10d ..... .30	Annealed	5d 1.00 .95	7/8-in. 1.75 2.05
6d 1.00	12d ..... .25	Light Heavy	6d ..... .95 .90	1-inch 1.65 1.95
7d ..... .70	16d ..... .15	4d \$1.25 \$1.20	7d ..... .85 .85	1 1/8-in. 1.55 1.85
8d ..... .60	20d-40d ..... .05	6d 1.15 1.10	8d ..... .75 .75	1 1/4-in. 1.50 1.80
9d ..... .60		8d 1.00 .95	9d ..... .75 .75	
10d ..... .45	Siding Nails	10d ..... .90 .90	10d ..... .70 .70	Barbed
12d ..... .40		12d ..... .85 .85	12d ..... .65 .60	No. 16 No. 17
16d ..... .25	Same advance as Smooth Box Nails	16d ..... .80 .80	16d ..... .60 .55	3/4-in. \$2.15 \$2.45
20d ..... .15		20d ..... .75 .75	20d-60d .50 .50	7/8-in. 2.00 2.30
		Boat Nails		1-inch 1.90 2.20
Flooring Brads		25 cents per 100 lbs. over Hinge Nails	Clout Nails	1 1/8-in. 1.80 2.10
6d \$0.55			Bright Annealed	1 1/4-in. 1.75 2.05
7d ..... .50	Slating Nails	Fine Nails	3/4-in. \$2.15 \$2.40	Spikes
8d ..... .35		2d \$1.95	7/8-in. 1.90 2.15	All sizes to 9-
9d ..... .35	2d \$1.20	3d 1.35	1-inch 1.65 1.90	inch \$0.10
10d ..... .25	3d ..... .95	4d 1.05	1 1/8-in. 1.50 1.75	10-inch and
12d ..... .20	4d ..... .85	5d ..... .75	1 1/4-in. 1.20 1.45	larger ..... .25
16d ..... .15	5d ..... .75	2d, extra fine 1.95	1 3/4-in. 1.10 1.35	Special gauges
20d ..... .05	6d ..... .65	3d, extra fine 1.55	1 1/2-in. .85 1.10	10c additional.

Special Extras on Standard Wire Nails

Annealed Nails, 25c per 100 lbs. extra.
Blued Nails, 25c per 100 lbs. extra.
Barbing Nails, 25 cents per 100 lbs. extra (except as provided for above).

Special Heads, 15c per 100 lbs. extra.
Special Points, 15c per 100 lbs. extra.
Galvanizing All Standard Nails, at special prices.

Sizes of Wire

Decimal Equivalents		Full Sizes of Plain Wire	American Steel & Wire Company's STEEL WIRE GAUGE No.	SIZES OF WIRE (Inches)		Milli- meters (Deci- mally)	Weight One Mile (Pounds)	Pounds per Foot	Feet to Pound
				Common Fractions	Decimally				
$\frac{1}{4}$ —.0156	$\frac{3}{32}$ —.5156		1		.2830	7.188	1128.0	.2136	4.681
$\frac{1}{2}$ —.0312	$\frac{1}{16}$ —.5312		2	$\frac{9}{32}$	.28125		1114.0	.211	
$\frac{3}{4}$ —.0468	$\frac{3}{32}$ —.5468		3	$\frac{1}{4}$	.250	6.668	970.4	.1838	5.441
$\frac{1}{8}$ —.0625	$\frac{9}{16}$ —.5625		4		.2437	6.190	836.4	.1584	6.313
$\frac{5}{8}$ —.0781	$\frac{3}{4}$ —.5781		5		.2253	5.723	714.8	.1354	7.386
$\frac{1}{2}$ —.0937	$\frac{1}{2}$ —.5937		6	$\frac{7}{32}$	.21875		673.9	.1276	
$\frac{7}{8}$ —.1093	$\frac{3}{4}$ —.6093		7		.2070	5.258	603.4	.1143	8.750
$\frac{1}{8}$ —.125	$\frac{5}{8}$ —.625		8		.1920	4.877	519.2	.0983	10.17
$\frac{9}{8}$ —.1406	$\frac{1}{4}$ —.6406		9	$\frac{3}{16}$	.1875		495.1	.0937	
$\frac{1}{2}$ —.1562	$\frac{1}{2}$ —.6562		10		.1770	4.496	441.2	.0835	11.97
$\frac{1}{4}$ —.1718	$\frac{1}{4}$ —.6718		11		.1620	4.115	369.6	.070	14.29
$\frac{3}{8}$ —.1875	$\frac{1}{2}$ —.6875		12	$\frac{5}{32}$	.15625		343.8	.0651	
$\frac{1}{2}$ —.2031	$\frac{1}{4}$ —.7031		13		.1483	3.767	309.7	.0586	17.05
$\frac{1}{2}$ —.2187	$\frac{1}{2}$ —.7187		14	$\frac{1}{8}$	.1350	3.429	256.7	.0486	20.57
$\frac{1}{4}$ —.2343	$\frac{1}{4}$ —.7343		15		.1250		220.0	.0416	
$\frac{1}{4}$ —.25	$\frac{3}{4}$ —.75		16		.1205	3.061	204.5	.0387	25.82
$\frac{1}{4}$ —.2656	$\frac{1}{4}$ —.7656		17	$\frac{3}{32}$	.1055	2.680	156.7	.0296	33.69
$\frac{1}{2}$ —.2812	$\frac{1}{2}$ —.7812		18		.09375		123.8	.0234	
$\frac{1}{4}$ —.2968	$\frac{1}{4}$ —.7968		19		.0915	2.324	117.9	.0223	44.78
$\frac{5}{8}$ —.3125	$\frac{1}{2}$ —.8125		20	$\frac{1}{16}$	.0800	2.032	90.13	.0170	58.58
$\frac{1}{4}$ —.3281	$\frac{1}{4}$ —.8281		21		.0720	1.829	73.01	.0138	72.32
$\frac{1}{2}$ —.3437	$\frac{1}{2}$ —.8437		22		.0625	1.588	55.0	.0104	95.98
$\frac{1}{4}$ —.3593	$\frac{1}{4}$ —.8593		23		.0540	1.372	41.07	.0077	128.6
$\frac{1}{8}$ —.375	$\frac{7}{8}$ —.875		24		.0475	1.207	31.77	.006	166.2
$\frac{1}{4}$ —.3906	$\frac{1}{4}$ —.8906		25		.0410	1.041	23.67	.0044	223.0
$\frac{1}{2}$ —.4062	$\frac{1}{2}$ —.9062		26		.0348	.8839	17.05	.0032	309.6
$\frac{1}{4}$ —.4218	$\frac{1}{4}$ —.9218		27		.0317	.8052	14.15	.002680	373.1
$\frac{1}{8}$ —.4375	$\frac{1}{2}$ —.9375		28		.0286	.7264	11.52	.002182	458.4
$\frac{1}{4}$ —.4531	$\frac{1}{4}$ —.9531		29		.0258	.6553	9.374	.001775	563.3
$\frac{1}{2}$ —.4687	$\frac{1}{2}$ —.9687		30		.0230	.5842	7.450	.001411	708.7
$\frac{1}{4}$ —.4843	$\frac{1}{4}$ —.9843		31		.0204	.5182	5.861	.001110	900.9
$\frac{1}{2}$ —.5	1=1.0		32		.0181	.4597	4.614	.0008738	1144.
			33		.0173	.4394	4.215	.0007983	1253.
			34		.0162	.4115	3.696	.0007000	1429.
			35		.0150	.3810	3.169	.0006001	1666.
			36		.0140	.3556	2.760	.0005228	1913.
					.0132	.3353	2.454	.0004647	2152.
					.0128	.3251	2.307	.0004370	2288.
					.0118	.2997	1.961	.0003714	2693.
					.0104	.2642	1.523	.0002885	3466.
					.0095	.2413	1.271	.0002407	4154.
					.0090	.2286	1.141	.0002160	4629.

LIST OF PRODUCTS

Amerite and Americore Rubber Covered Wire

American Wire Rope

Airplane Wire and Strand

Piano Wire

Pipe Organ Wire

Mattress Wire

Weaving Wire

Ignition Wire

Broom Wire

Flat Wire—Flat Cold Rolled Steel

Fence Wire

Spoke Wire for Wire Wheels

Electrical Wires and Cables

Wire Hoops

Rail Bonds

Bale Ties

Aerial Tramways

Tacks

Auto Towing Cable

Nails, Staples, Spikes

Barbed Wire

Woven Wire Fences

Fence Gates

Steel Fence Posts

Concrete Reinforcement

Springs

Juniata Horseshoes and Calks

Sulphate of Iron

Wire Rods

Screw Stock

Cold Drawn Steel—

round, square, hexagon,

special shapes

Poultry Netting

Wire of Every Description

Separate illustrated catalogue issued for each of these products.

Fence Staples

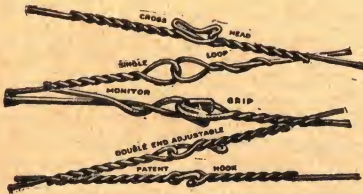


In ordering Fence Staples, specify length, and whether they are to be Polished or Galvanized. The term "Polished" means ungalvanized.* Unless otherwise specified, we furnish them made of No. 9 wire on which base prices apply. Lighter or heavier Staples can be furnished at an extra cost. Fence Staples are packed in kegs containing 100 pounds at base price. Also packed in 5-lb., 10-lb., 15-lb., 25-lb., and 50-lb. boxes for which "extras" are charged. Table showing approximate number of staples to the

Length in Inches	Approximate Number to the Pound (No. 9 Gauge)
$\frac{7}{8}$	120
1	108
$1\frac{1}{8}$	96
$1\frac{1}{4}$	87
$1\frac{1}{2}$	72
$1\frac{3}{4}$	65
2	58

pound will be found useful in determining the quantity required for a certain number of rods of woven wire fence of a given height. Figure on one staple for each horizontal wire at each post. For example: a "1047" fence will require 10 staples in each post, and, estimating the posts one rod apart, a 40-rod roll of fence would require 400 staples, which in $1\frac{1}{2}$ inch length would be equivalent to about $5\frac{1}{2}$ pounds.

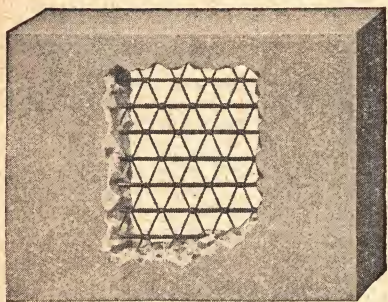
*For use with woven wire fence, and for the slight difference in price, we recommend GALVANIZED Staples, because the zinc coating protects them from corrosion. This in the long run saves expense and extra labor replacing rusty staples.



American Bale Ties

Made by American Steel & Wire Company

THESE old and tried ties have passed through years of refinement in manufacture and trial in actual use until they are now standard of the world. Much depends upon the strength and reliability of a bale tie. Heavy commercial loss results from the use of ties of unproven worth. No other form of wire calls for more care in manufacture, beginning with the earliest stages of steelmaking down to the finished tie—no other form of wire has to stand more strain and abuse. Bale tie wire **MUST** be made in the highest perfection possible—anything less invites heavy damage and loss.



Concrete Roads Must Be Reinforced

It is demonstrated beyond doubt that to make concrete roads proof against heavy motor traffic, weather and time, a fabric of steel must be incorporated in the concrete.

Several great States have so ruled

American Steel & Wire Company's Concrete Reinforcement

Fulfills Every Engineering Requirement

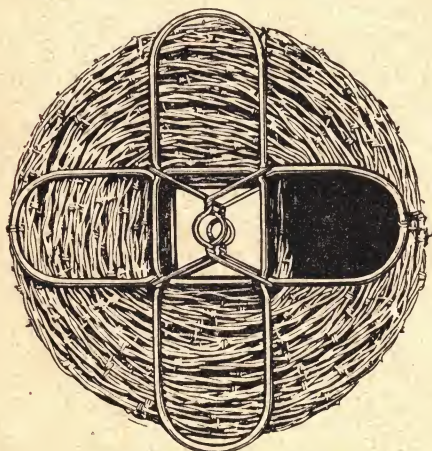
Send for our Book on Road Building

American Barbed Wire

Made by the American Steel & Wire Company
in the following standard brands

American Glidden	Ellwood Glidden
Baker Perfect	Waukegan 2-Point
Lyman 4-Point	Waukegan 4-Point

Illustrated Catalogue furnished upon application



New Wire Reel, Patented



AGRICULTURAL SULPHATE OF IRON

For protection against HOG CHOLERA, WORMS and other diseases of swine. Useful in certain DISEASES OF CATTLE and POULTRY and in the destruction of TYPHOID FLIES.

When mixed with other medicinal ingredients, as per standard formulas, Sulphate of iron becomes a standard remedy for the prevention of animal diseases. Put up in cartons, barrels and sacks. For sale everywhere.

Send for Descriptive Literature

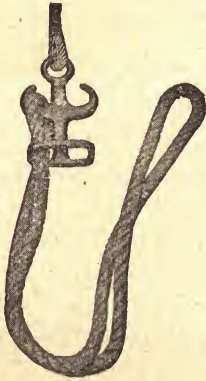
American Steel & Wire Company

American Steel & Wire Company's

Auto Towing Cable

FOR PASSENGER CAR SERVICE

Patent applied for



Manila Loop Attached.
Always remains in
Hook. Can be detached
when loop wears out.



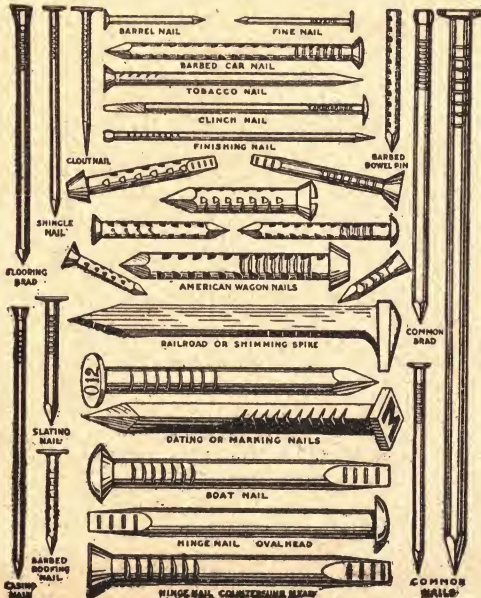
Other end being
inserted. Large
ring provided to
easily insert loop
tho water and
sand soaked.



End of Loop hook-
ed—ready for tow-
ing. Quadruple
strength—firmly
attached. No
loosening and
dropping the tow.

American Wire Nails

Made by American Steel & Wire Company



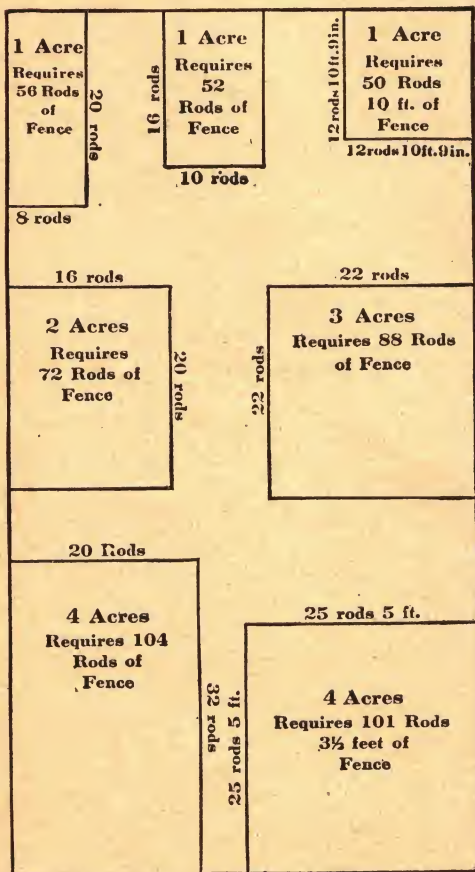
The Mills that developed the
Wire Nail in America

Common and Miscel-
laneous, Box, Casing,
Flooring, Fence, Tobacco,
Boat, Roofing, Slating,
Shingle, Finishing,
Clinch, Hinge, Car,
Barrel, Fine, Lining,
Clout, Broom, Basket,
Berry-box, Wagon,
Dowel, Tie-marking
Nails, Staples,
Escutcheon Pins,
Large Head Barbed
Roofing Nails,
R. R. and Boat Spikes.

*Catalogue illustrating all kinds of
Wire Nails furnished upon request*

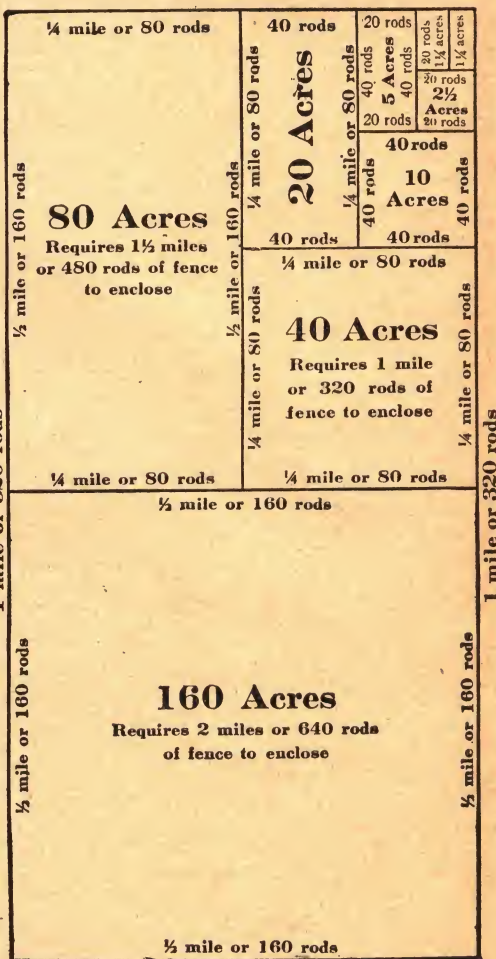
This is the most complete American Fence catalogue ever published. If you anticipate at any time building Fence or repairing Fences now on your property, this catalog should be kept for reference, as the instructions for Fence building on pages 41 to 44, if followed, will insure increased life for your Fence. The following diagrams indicate the number of rods of Fence required to enclose fields of different sizes. The dimensions given are exact, so that in buying Fence, sufficient allowance should be made to cover Fence taken up in wrapping around End and Corner Posts.

Dimensions of 1, 2, 3 and 4-Acre Lots and fence required to enclose them



Number of Rods of Fence Required to Enclose Fields of Different Sizes

This Diagram Shows $\frac{1}{2}$ Section, or 320 Acres



Full Directions for Ordering American Fence Shown on Opposite Page

How to Order American Fence

Specify Quantity (in number of rods).

Specify Design Number. { The last two figures indicate the height in inches.
 { The preceding figures indicate number of horizontal bars in fence.

Specify Distance between Stay Wires.

Specify the Specifications desired (which indicate size of the wires).

Specify Size of Rolls desired.

For Example:

500 Rods Design 1047-6 in. stay American Fence Spec. A—25/20-rod rolls.

500 Rods Design 1047-12 in. stay American Fence Spec. D—5/40-6/30-6/20-rod rolls.

200 Rods Design 2158-6 in. stay American Fence Spec. F—5/20-10/10 rod rolls.

How to Order Lawn Fence and Park and Paddock Fence

In ordering American Lawn Fence, specify Quantity in rolls, Height in inches, and Specifications. Note rolls contain 150 lineal feet.

For Example: 3 Rolls 42-inch American Lawn Fence, Specifications A.

On Diamond Lawn Fence, specify Quantity in rods, Height in inches, Specifications, and Size of rolls. Note rolls contain 10 and 20 rods.

For Example: 60 Rods 50-inch Diamond Lawn Fence, Specifications K—3/20-rod rolls.

On Park and Paddock Fence, specify Quantity in rods, Design number, Distance between Stay Wires and Size of rolls.

For Example: 100 Rods Design 2488 Park and Paddock Fence, 6-inch Stay—10/10-rod rolls.

How to Order Corn Cribs, Corn Cribbing and Union Lock Poultry Fence

In ordering American Steel Corn Cribs, specify the Quantity and Size of Crib by number.

For Example: 10-No. 75 American Steel Corn Cribs.

On American Steel Corn Cribbing, specify Quantity in rods, Height in inches, and Size of rolls.

For Example: 60 Rods 50-inch American Steel Corn Cribbing—2/30-rod rolls.

When ordering Union Lock Poultry Fence, specify Quantity in rods, Design number, Specifications, and Size of rolls.

For Example: 50 Rods Design 2560 Union Lock Poultry Fence, Specifications L—5/10-rod rolls.

How to Order American Tubular Steel Gates

In ordering American Tubular Steel Gates, specify:

Quantity.

Width of Opening (in feet).

Height (in inches).

Style of Gate (Walk, Drive, Tilting, etc.).

Whether Galvanized or Painted Frame.

Whether Plain or Ornamental Top.

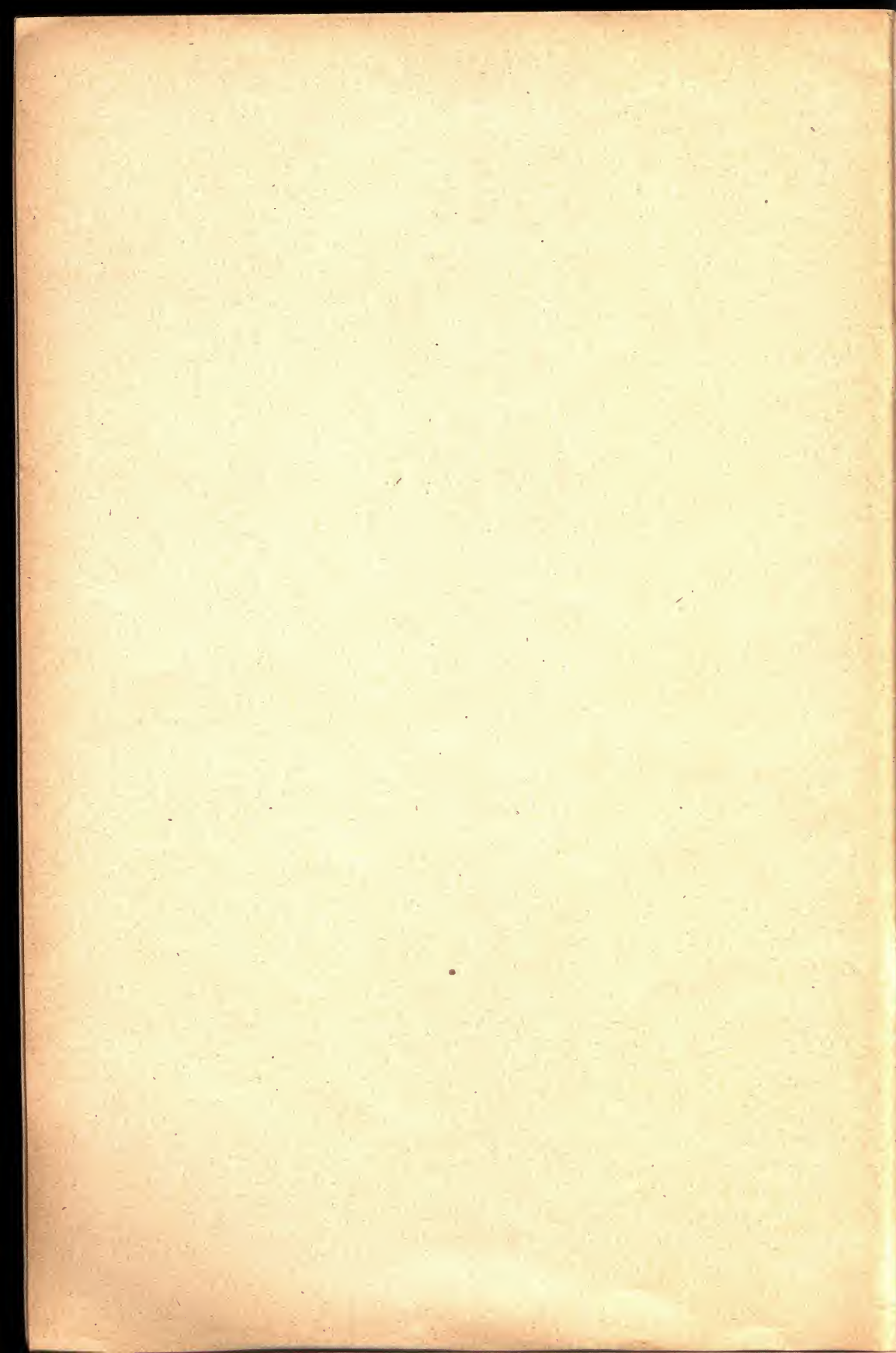
Fixtures desired (whether for Wood or Steel Posts).

For Example:

3- 3 ft.x50 in. Walk Gates, Galvanized Frame, Ornamental Top, for Steel Posts.

3-10 ft.x50 in. Single Drive Gates Painted Frame, Plain Top, for Wood Posts.

3-14 ft.x50 in. Tilting Gates, Galvanized Frame, for Steel Posts.



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By MANLEY CHAMPLIN	

State Leaders of Barberry Eradication

Leonard W. Melander, University Farm, St. Paul, Minn.
George C. Mayoue, Agricultural College, N. Dak.
Henry C. Gilbert, Brookings, S. Dak.

The Life Story of the Black Stem Rust of Wheat and Other Grains



Diagram furnished by the U. S. Department of Agriculture, Office of Cereal Investigations. C. R. Ball, Chief

Black Stem Rust of Wheat and How Barberry Spreads It

By E. C. STAKMAN

Agent, U. S. Department of Agriculture

Black stem rust is the worst enemy of spring wheat. The hard spring wheat of Minn., the Dakotas, Montana and West Canada is the best bread-making wheat in the world. But every year the black stem rust destroys millions of bushels of this wheat. The wheat grower in the spring wheat region fears black rust more than any other enemy, and with good reason. In 1904 this dreaded disease destroyed 300,000,000 bushels of wheat in the U. S. and Canada. In 1919 black rust again took a toll of 30,000,000 bushels of wheat in Minnesota and the Dakotas, while in 1920 the loss was probably about the same. We cannot continue to grow black rust and wheat too. Either we must get rid of the rust or the rust will get rid of the wheat.

The Common Barberry Spreads Rust

The rust gets an early start in the spring from the common barberry. This bush has been planted for years as an ornamental shrub in cities, villages and on farms throughout the state. The bush has escaped from cultivation and is beginning to run wild in many localities in the state and unless it is checked soon it will become firmly established as a wild bush everywhere.

The Cause of Rust

Rust is not caused by weather, although it is aided by certain weather conditions. It is caused by a mold-like parasite which lies dormant on straw and stubble during the winter and then spreads to the common barberry in the spring. From the barberry the rust spreads to grasses and grains. Does this sound strange? Maybe it is strange; but it is true. Did you ever notice the amount of rust on grains or grasses near barberry about the middle of May—before there is any rust in grain fields or on grasses some distance from barberry bushes? This has been observed thousands of times. Why is it? Read the story of the rust parasite.

How Barberry Spreads Rust

Black stem rust is caused by a well known fungous parasite. In the spring this parasite grows on the common barberry on which it forms rust spores (in "cluster cups") and these spores (seeds) are blown by the wind to grasses or grains. They germinate in moisture furnished by rain or dew and infect the grain or grass plants. The parasite gets inside the plant, takes its food from this plant and then within a week or two produces the red or summer spore, rust familiar to any grain farmer. This red rust is the summer stage of the black stem rust. These summer spores in turn are blown about by the wind and infect other grass and grain plants. Thus many crops of red spores may be produced and each crop causes more rust.

Later in the season the rust becomes black. This is the winter stage. The winter spores cannot germinate at once but lie dormant on the stubble or straw until spring. Then they germinate but they cannot directly infect grains or grasses. This black stage of the rust can infect only the common barberry.* Destroy the common barberry and the black stage of the rust becomes harmless. The rust cannot then get an early start in the spring, because it cannot maintain itself in the Northern States in the red stage during the winter.

The Common Barberry Proven Guilty

Time and again the common barberry has been convicted of spreading rust. Even as long ago as 1660 the people of Rouen, France, were so thoroughly convinced that barberry caused wheat to rust that they passed a law sentencing all common barberry bushes to death. And in this country before the American Revolution was fought, Massachusetts, Connecticut and Rhode Island passed laws requiring the destruc-

*Several closely related shrubs can also be infected though these are not native and are almost unknown in the spring wheat states.



Diagram showing improper method of digging out barberry plants because rootlets will sprout again and the work must be done over



Young barberry shoots growing from rootlets left in the ground after removing parent bush

tion of common barberry. These people did not know the scientific facts about the rust as we know them today. But, they saw that wheat always was rusted more heavily near barberry bushes than at some distance from them. They did not know just why—and they didn't care. They used their common sense and they dug the bushes and burned them, root, shoot and fruit. The barberry bush has not reformed since those early days. It spreads as much rust as it ever did. And now when we know exactly how it does this, are we going to stand idly by while this bush continues to aid rust in destroying yearly millions of bushels of the best wheat in the world? Which do we prefer—a scraggly, thorny worthless bush or our No. 1 hard, dark northern wheat? The barberry bush is under the ban of the law; will we stand by the bush or will we stand by the law?

The Common Barberry an Outlaw

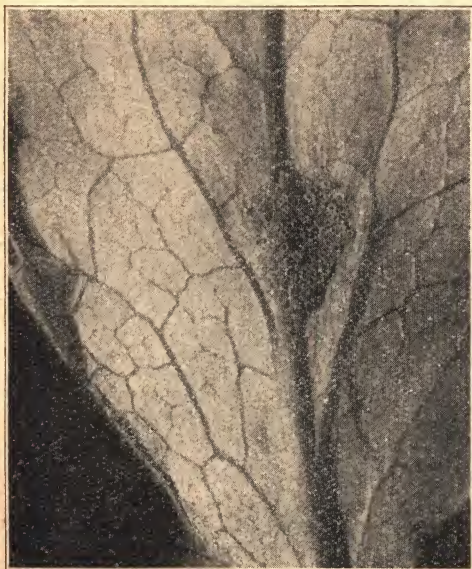
So clear was the case against the common barberry that in 1917 North Dakota passed a law requiring its destruction. Since then Montana, Colorado, Nebraska, South Dakota, Iowa, Minn., Wisconsin, Illinois, Michigan, and Indiana and the prairie provinces of Canada have made compulsory the destruction of the barberry. Congress has made substantial appropriations to assist in the fight against this dangerous bush and the U. S. D. A. has led in the movement by co-operating with the several states to reduce rust losses by destroying the bush. But even so the U. S. D. A. and the state authorities cannot alone find all the bushes. The success of the fight against the barberry depends on the public interest and on the people who own the bushes. Mere laws will not eradicate barberries, we want men with shovels and grubhoes. Above all, men, women and children who know the barberry when they see it. Learn to know the common barberry and destroy it! This is the public duty of every citizen especially in the rural communities. Is it on your premises? Look and see; if it is there, dig it out. Is it in your neighborhood, if it is, get the owner to dig it out—if he refuses, report it to the state experiment station. There still are thousands of bushes in the spring wheat states of the upper Mississippi Valley.

Thousands of Barberry Bushes Still Spreading Rust

No movement of this sort can possibly escape the chronic objector. Because laws have been passed requiring the destruction of the rust-spreading barberry bushes, and because since the passage of the laws rust has continued to cause damage, the "I told you so brigade" is or will soon be clamoring to be heard. Let's see what they are shouting about. They say the barberry bushes are out and still the rust destroys the wheat. But the barberries are far from out. Do you realize that the barberry eradication campaign has just begun? Do you think it can be done in a season? For the last 60 years people have been planting the bushes in Minnesota and the neighboring states; and these bushes have been escaping from lawns, hedges and gardens during all these years. Is it reasonable to suppose that all this misguided effort can be undone in two or three summers? Observe and consider very carefully the following facts: Three quarters of a million bushes have already been found in Minnesota in the last three years! In Minnesota alone over 130,000 rusted barberry bushes already have been found on over 750 farms! Fifty thousand bushes have been found running wild in 28 counties! Do you realize that there is scarcely a single wheat field in the principal wheat growing region of Minnesota which is more than 10 miles from a rust spreading barberry bush? And do you realize that the rust may begin to spread to wild grasses before May 15 and that the rust then continues to spread to wheat and other grains from these grasses? During the summer of 1920 alone about 4,500 bushes were found in the rural districts in Southern Minnesota and of this number 4,252 bushes were rusted. Stop and think what it means to have several hundred rusted barberry bushes in a county, when every bush can easily spread rust for a distance of fifteen miles or more. Is it any wonder that the black rust destroys wheat when thousands of barberry bushes are ready to give it such an early start in the spring? And can any one doubt that the destruction of these bushes will reduce rust



Proper way to dig out a barberry bush. Be careful to get all the roots and shoots. Dig a large hole to be sure



Microscopic enlargement showing the black stem rust (*Puccinia Graminis*), passing the cluster cup stage upon leaf of barberry. If no barberry can be found, last year's rust will die. Black stem rust will not make black stem rust unless it passes this stage on the barberry. Otherwise it is harmless.

losses? Do you realize that Denmark actually has controlled rust by destroying the common barberry?

How Denmark Controlled Rust

In 1903 Denmark outlawed the common barberry. This action stirred up quite a controversy. Many Danes grumbled that it was only another visionary scheme of a group of deluded enthusiasts. But the amount of black stem rust decreased as the barberry bushes were destroyed and there has not been a single serious outbreak of rust in Denmark since 1903. For several years after the law was passed there were local outbreaks of rust, but in every case barberry bushes were found in the vicinity. When these bushes were removed the rust did not again appear. Farmers in Denmark no longer worry about black stem rust; it disappeared with the barberry. Think of that and then decide whether you want to keep your barberry bush. Wheat does not thrive where there is barberry. If we want to grow wheat we will have to stop growing barberry.

Protect Future Wheat Crops

About 750,000 common barberry bushes have been found in Minnesota. Everyone of these bushes came directly or indirectly as a result of planting. Barberry is not native; it was brought in. Suppose all these bushes remained to produce seeds which are spread by water, birds and other animals. Within a few years there would be so many bushes that only the driest kind of weather or a miracle could save the wheat from rust. Can we afford the risk? It will be hard enough to destroy all the bushes which still remain but it

can be done by vigorous work and without delay. A delay of a few years would make the job immensely more difficult if not entirely hopeless. Now is the time to dig the common barberry! Dig and burn. Get all the roots in order to prevent them from spreading again. We need the wheat; the barberry is its natural enemy—Destroy the common barberry!



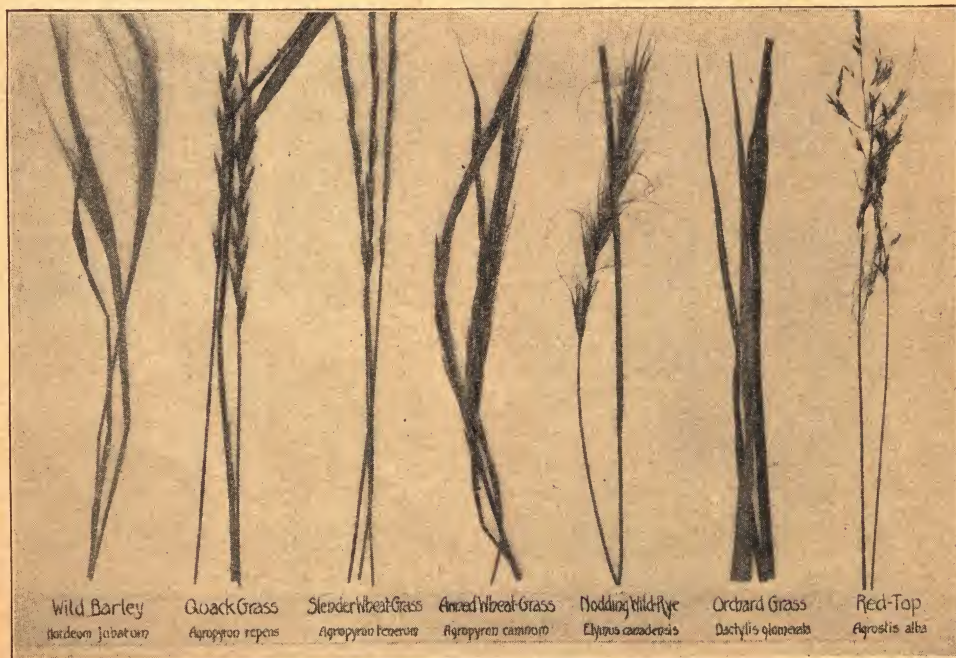
COMMON BARBERRY WHICH SPREADS RUST

Springtime sprout of common barberry, green or purple. The plant is easily identified by the saw-tooth indentations on every leaf, each tooth terminating in a sharp needle-like sticker pointing forward. At the axil of the leaf will be generally found three sharp spines.

The Japanese barberry is easily distinguished, because its bark is darker, its spine shorter and usually only one at the base of each leaf, and the leaves are rounded. This shrub is entirely harmless and should not be dug out.



HOW COMMON BARBERRY GROWS ALONG THE FENCE ROWS AND ROADSIDES
 Surrounding these bushes the grass is always badly infected with rust which travels from grass to grass and upon the wind until wheat fields are reached and destroyed



Some of the common grasses which help to spread wheat rust from the barberry

Rust Caused \$275,000,000 Wheat Loss; Barberry Bush Held to Blame

Drive to Eradicate Weed Now on in Earnest in North Dakota—Federal Department Helps

By **SIDNEY W. HOOPER**

Extension Division, North Dakota Agricultural College

Each farmer of North Dakota lost an average total of \$2,928 during two years, 1916 and 1919, due to the presence of barberry bushes in the northwest, according to W. R. Porter, of the extension division at the North Dakota Agricultural College, who places the total damage done to wheat by rust during those two years at \$275,000,000. The loss in 1920 was fully as great.

Twenty-one years ago, Mark A. Carleton, pathologist with the United States Department of Agriculture, said regarding the rust situation in North Dakota: "Wheat does not seem to be commonly damaged in this state although leaf rust is always present and is sometimes abundant."

Today leading scientists predict that within a decade wheat can not be raised profitably in North Dakota unless some steps are taken to control rust, which apparently, is becoming more prevalent every year.

Early Seeding Helps

Early sowing of early-maturing varieties of wheat, such as the Marquis, usually results in a good crop being harvested, while fields of wheat that are ten days or two weeks later in development will be heavily damaged by rust when harvest time comes around. Early sowing of wheat, however, is oftentimes impossible, especially in the Red River Valley, where the soil is so heavy and rich in organic matter and the fields must be quite dry before they can be worked. Marquis wheat sowed late will usually be damaged by the rust as much or more than bluestem, fife or velvet chaff maturing at the same time. Sowing of an early-maturing variety of wheat, then, is a too uncertain remedy to be generally recommended.

Experts agree upon the elimination of the barberry bushes as the only logical way to fight the wheat rust. They have found that the barberry bush furnishes a home for the rust, and that from the growth produced on the barberry leaves, the rust spores, which are microscopic bodies corresponding to seeds in plants, sally forth and attack the growing wheat.

Spores Produce Rust

These red spores start to grow when they come in contact with the leaves or stem of the wheat plant. A hairline filament is produced which enters the tissues of the plant. In a short time this growth produces the red rust spores in great quantities. These spores in turn are carried by the wind or other agencies to other wheat plants and soon a big area is infected. Later develops

the black rust, which is a later form of spore produced from the same growth that gave rise to the red spores. In this form the rust passes over the winter on the wheat stubble and grasses growing the following spring and producing still another kind of small spores, which attack the barberry plant, thus completing the life cycle. To maintain its vitality, the rust must live for a portion of the time on the barberry plant.

The wind will carry rust spores from the barberry plant hundreds of miles to the growing wheat, making imperative a county-wide campaign, if best results are to be accomplished. This campaign, supported by the U. S. Department of Agriculture with an appropriation of \$150,000 to be spent in 13 northwestern states, is now under way. Of this sum, \$10,000 is spent annually in North Dakota. Last year 1,171 barberry bushes were located and destroyed by a crew of men working under the direction of George C. Mayoue, assistant pathologist of the federal department of agriculture who has charge of the work in North Dakota and is stationed at the North Dakota Agricultural College. The workers covered every town and city in the state, all of Stutsman and Richland Counties, making a section to section examination, 90 per cent of Cass County and 60 per cent of Barnes County. The average cost of locating a barberry bush was \$11.49, while the cost of the search per acre of wheat involved was less than three-tenths of a cent.

Drive Now On

The drive against the remaining barberry bushes in North Dakota has already opened with Mr. Mayoue directing a crew of men in their search for the bushes.

"The search for barberry bushes is a difficult task, as they will often be found in the most out-of-the-way places," said Mr. Mayoue. "While the bush is a cultivated, ornamental shrub, it will often escape from cultivation and will be found growing wild around abandoned homesteads, in graveyards, at the edge of woods, roadsides and many other places. We want the co-operation of every resident of North Dakota in the campaign to eliminate the bushes.

"A farmer who would keep barberry bushes on his farm could quite logically pen a half dozen hungry wolves in with his flock of sheep. Not only is it to his own financial interest to see that all barberry bushes on his own farm are destroyed, but also he should make it a point to see that all are destroyed in the neighborhood as the work must be complete to be effective.



STEMS AND SPINES OF JAPANESE AND
COMMON BARBERRY

If persons who know of the location of any barberry bushes in the state will write to me, I will see that the bushes are destroyed."

During the past winter more than 5,000 bulletins on barberry eradication have been mailed out from the North Dakota headquarters to residents of the state, 10,000 posters have been distributed, 16,000 circular letters and 8,000 cards showing the life cycle of wheat rust.

Bush Grows Tall

The barberry plant grows from five to ten feet tall in this locality, sometimes attaining a height of twelve feet tall in the south. The leaves are oval shaped with a sawtooth edge, and green or purple in color. Groups of thorns arranged in threes cover the branches which are ribbed and give the plant its name. The fruit is about the same size as a currant, but is more elongated and is bright red in color.

Prof. H. L. Bolley, of the North Dakota experiment station, was one of the first scientists to demand the destruction of the barberry bush in this country as a measure for the control of wheat rust, and North Dakota, in 1916, was the first state to pass a law providing for barberry eradication. When the United States entered the war and greater production of wheat became one of the vital needs of the nation, the federal department of agriculture took up barberry eradication. During the past two years, legislation providing for the extermination of the barberry has been adopted in twelve additional states, Colorado, Illinois, Indiana, Iowa, Michigan, Minnesota, Nebraska, Wisconsin, South Dakota and Wyoming.

North Dakota made an appropriation of \$2,500 to be used during 1917 and 1918 for barberry eradication. This sum was exhausted in making a survey of the cities of the state, and all further work has been carried on with federal funds. Four states have made appropriations, in addition to the federal appropriation, Minnesota, Iowa, Wisconsin and Illinois. An agricultural appropriations bill now being considered by congress carries an item of \$150,000 for the continuance of the work this year.

That the various states should make appropriations—at least meeting, if not exceeding—the federal appropriations, is the opinion of many agricultural workers. The \$10,000 spent in North Dakota last year was found to be approximately sufficient to cover a farm to farm examination of three counties. Thousands and thousands of barberry bushes are left in the rural districts in the other 49 counties of the state. At the rate of three counties per year, 17 years will be required to finish the work of barberry eradication in the state.

The illustration on this page shows clearly the difference between the Japanese barberry on the left and the common barberry on the right. The Japanese barberry has a dark brownish bark and generally only one sticker, though sometimes two, at the leaf axil.

The stem of the common barberry, which is the dangerous one, is easily distinguished by much larger spines growing in groups of three or more, the bark is of a gray color with long indentations which are clearly shown in the picture.

The Japanese barberry is harmless, the common barberry, green or purple, is dangerous.

What Shall We Do About Rust?

By **MANLEY CHAMPLIN**

Agronomist South Dakota Agricultural College

The above question is one that is uppermost in the minds of wheat growers everywhere. It is a difficult question to answer because there is nothing we can do that will surely prevent its recurrence. All that we can hope to do is to check or avoid its ravages to a certain extent. There are several things that can be done to aid in this respect. No one thing is sufficient.

The Cause of Rust

Rust is of several kinds, usually named after the plant it injures as rose rust, ash rust, crown rust of oats, leaf rust of wheat and stem rust of grain. The kind which gives most trouble in this territory is *Puccinia graminis*, or stem rust of grains and grasses. Recent studies by E. C. Stakman, of the University of Minnesota, and his associates have indicated that there are a number of different strains or varieties of *Puccinia graminis*. They were able to determine this from the fact that certain varieties of wheat proved rust resistant in one locality and susceptible in another. Further experimenting proved this to be due to the fact that there are different strains of the same general group of rust. This is worth knowing, because it shows why some promising varieties of rust resistant wheat are a disappointment when transferred to another place. It also has a tendency to show that rust doesn't blow about over great distances so much as was thought, but tends more to develop in one region and become adapted especially to that region, the same as some varieties of corn are especially well adapted for a certain region. This last suggestion remains to be proven by more experimenting and study. It can hardly be said to be proven as yet, but if it is true it relieves us of one source of worry at least, namely, that rust will continue to come north to us from the south where they have it the year around.

Stem rust of wheat is caused by a parasitic or fungous plant which grows upon and gets its nourishment from the wheat plant. This fungus has two ways of propagating. The first consists in producing red spores which are carried to other wheat by the wind or air in motion. Here they cause new infection and produce more red spores. It is these red or brownish spores that give rust its name from the resemblance they bear to iron rust. These red spores in great abundance are found on the wheat stubble and also on wild barley in the autumn. It is generally believed that these red rust spores die during severe winter weather in Dakota and Minnesota, because no one has been able to find any live spores in the spring, but of course there is a possibility that some of these spores winter over in protected places under snow drifts, and in fence rows, etc., where wild barley grows.

The rust does not depend upon the red spores to carry over winter, but produces a set of black spores with thick walls which live over winter

on stubble and wild barley. These black spores give rise to the name black rust which is often supposed to be a separate disease, but is in reality another part of the same disease—*Puccinia graminis*.

These black spores winter over alright, as they are very hardy, but the joke of it is that they are unable to infect wheat plants the following spring. Strange as it may seem these black spores infect the common barberry instead of wheat. Then the barberry infection spreads back to the wheat. This is what the plant disease specialists mean when they speak of an intermediate host. It is like some of our neighbors (not ourselves of course) used to be in the days when saloons prevailed in the villages. They could go straight to town alright but they couldn't go straight home. They had to pay a visit to the saloon on the way. So the black spores infect the barberry and the barberry infection spreads to the wheat. This fact gives us one point of attack.

Barberry Eradication

This is the reason for all this "Swat the Barberry" campaign. If the barberries are all destroyed, root and branch, they cannot become infected from black rust spores, nor can they spread the infection back to the wheat. It undoubtedly helps to swat the barberry, but unfortunately that is a hard thing to do. Originally it was only a cultivated shrub on folks' lawns, but it has spread in some places to the thickets along the streams and lakes where birds have carried the seeds. So it is no small job to do away with the barberry. The United States Government has sent out men and the several states have passed laws but these two methods are ineffective unless every land owner enlists in the fight and insures that there are no barberries on his land.

The whole proposition, however, is not hopeless. Denmark is the classic example of a land that fought and whipped the rust. For over a hundred years they fought the barberry in a half-hearted, spasmodic fashion until finally the government decided to make a clean job of it and did. For the past ten years or more, Denmark has been free from rust epidemics. In addition to ridding the land of barberries, the Danes farm clean. They did not permit weeds and grasses to grow along the fence rows. This clean farming, combined with barberry eradication, has had a marked effect in preventing rust. Can we emulate Denmark?

What Can We do as Individuals?

Each of us can help reduce rust ravages if we will even though we may be helpless about doing away with the disease. We can see to it that there are no barberries on our own land. We can destroy the wild barley on our own farms. Perhaps we can burn out our fence rows if we



THE BERRIES OF THE BARBERRY

The waxlike berries of the barberry grow in clusters something like currants. The berries turn red in the winter and wrinkle like raisins. The bush can always be identified by the roughly indented gray bark and three or more sharp spines at the base of each leaf cluster.

have steel posts, or take up our fences gradually, sow an alfalfa strip and put the fences down again, thus eliminating the weedy fence row. We can have our land ready in the fall except for a little surface work and thus get the seed in early. We can sow the earliest maturing variety that will produce a paying crop. We can fan and grade our seed and use the best seed we can get so as to give the crop a fair and thrifty start. Some of us can grow Kanred winter wheat which resists rust and ripens early so as to dodge the rust. Others who cannot grow winter wheat can bend every effort toward maturing their spring wheat early. Good preparation of the land combined with good seed and early sowing will help.

Early Varieties

In Canada, Dr. Saunders has developed Ruby and Marquis wheat. Seager Wheeler has produced Red Bobs and Kitchener. When given the same chance, Ruby is earliest; Red Bobs is second; Marquis and Kitchener are about the same. All of these varieties are of good milling quality. None of them have beaten the Marquis, except in certain localities, so far as yield is concerned.

A week's gain in maturity is a wonderful help in some seasons in dodging rust. Ruby ripens a week earlier than the Marquis at Saskatoon, Saskatchewan, but it does not yield as well. Red Bobs ripens three days earlier and yields almost as well. Kitchener ripens about the same and yields about the same. Whether Ruby and Red Bobs will yield as well as Marquis in eastern Dakota and Minnesota and at the same time gain the advantage of early maturity is a question that can be satisfactorily answered only by local trials. Some of the experiment stations have tried for a short time but not long enough nor extensively enough to warrant any one in forming a definite conclusion. A few trials arranged by county agents of one to ten acres each of Ruby and Red Bobs can do no harm and may easily lead to real gains in the fight against rust in some localities, *not because they are rust resistant but because they are bred to earliness and may thus dodge the rust.*

Rust Resistant Varieties

Certain varieties of durum wheat are rust resistant in the regions where they are adapted. The most valuable of these are Acme and Monad amber colored durum. "D5" is a number applied by the North Dakota Agricultural College to a selection of durum wheat having red kernels. Red durum wheat is put in a class by itself under the U. S. system of grain grades because of its lack of milling quality. Any amber durum containing over 10 per cent of red durum is classed as red durum on the terminal market. The D5 selection of red durum is an excellent producer and is rust resistant, but those who grow it are taking considerable risk as to the possibility of marketing at a profitable price because it will not make bread nor macaroni. Kubanka wheat, the standard durum variety of the Dakotas, is of amber color and possesses good macaroni-milling quality. It usually escapes rust all right if sown early but rusts if sown too late. None of these varieties are well adapted to sowing in



CHARACTERISTIC APPEARANCE OF THE BARBERRY BUSH
IN CULTIVATION

These bushes grow generally from three to six feet high, but many samples have been found which are as much as ten to twelve feet high. Most of these bushes have already been removed from towns and cities, but many of them are growing wild, having been sown broadcast by the action of water and birds. Many of them grow in rocky inaccessible places and every land owner should make it a point to be sure that no barberry is growing on his place in ravines or wild rough land.

regions that have upwards of 22 inches of rain fall. This practically limits their production to the western three-fourths of the Dakotas and eastern Montana, Wyoming and Colorado. Seasons having dry weather during heading period are best for Acme, Monad and Kubanka, as well as for other varieties of durum wheat.

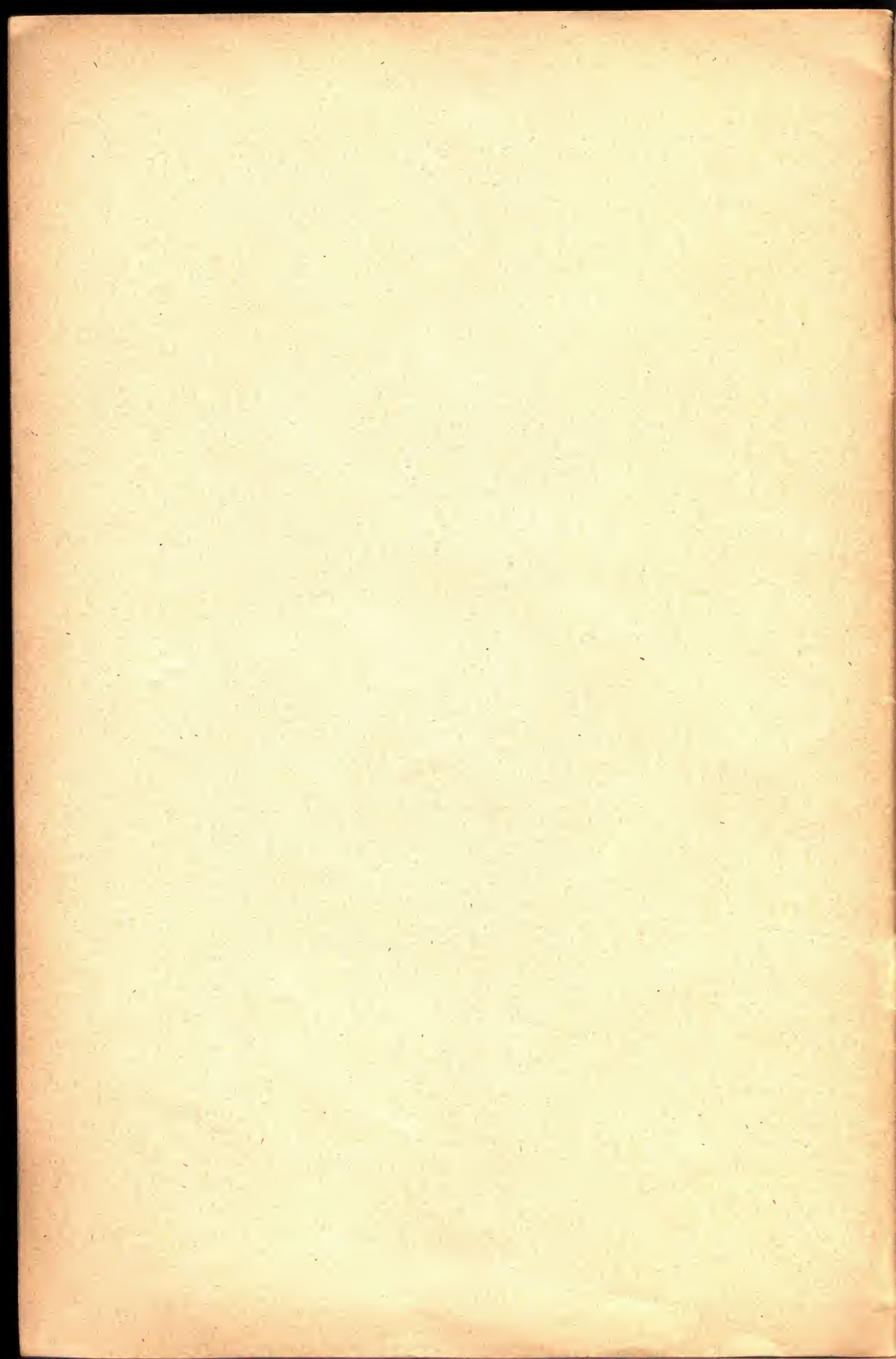
Up to date, there is no variety of hard spring wheat of the common or bread wheat type, that is available to commerce, which is rust resistant.

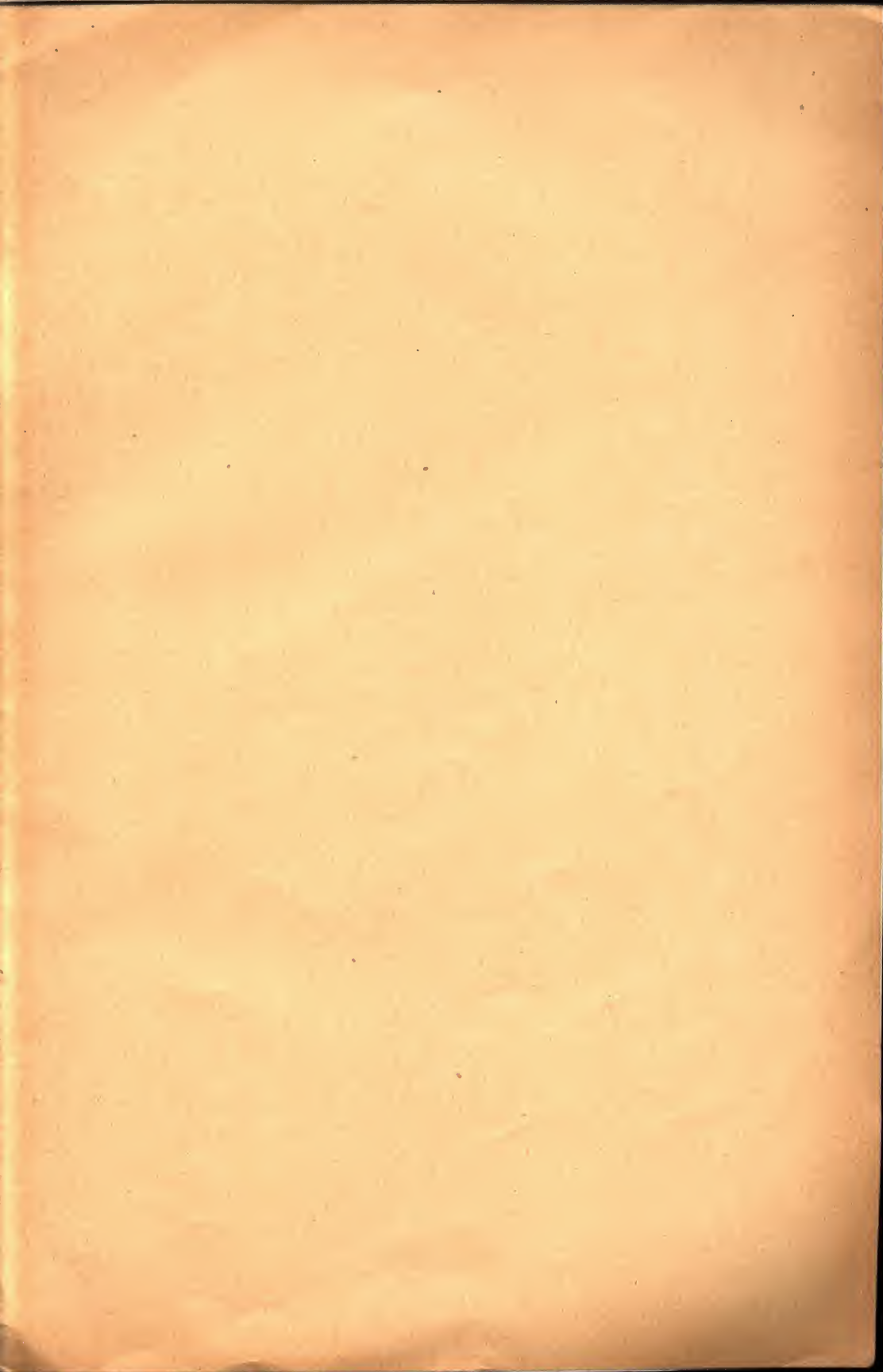
A new variety developed by Clark and Waldron at the North Dakota Agricultural College, named Kota, shows some promise as a rust resistant bread wheat, but is still in the experi-

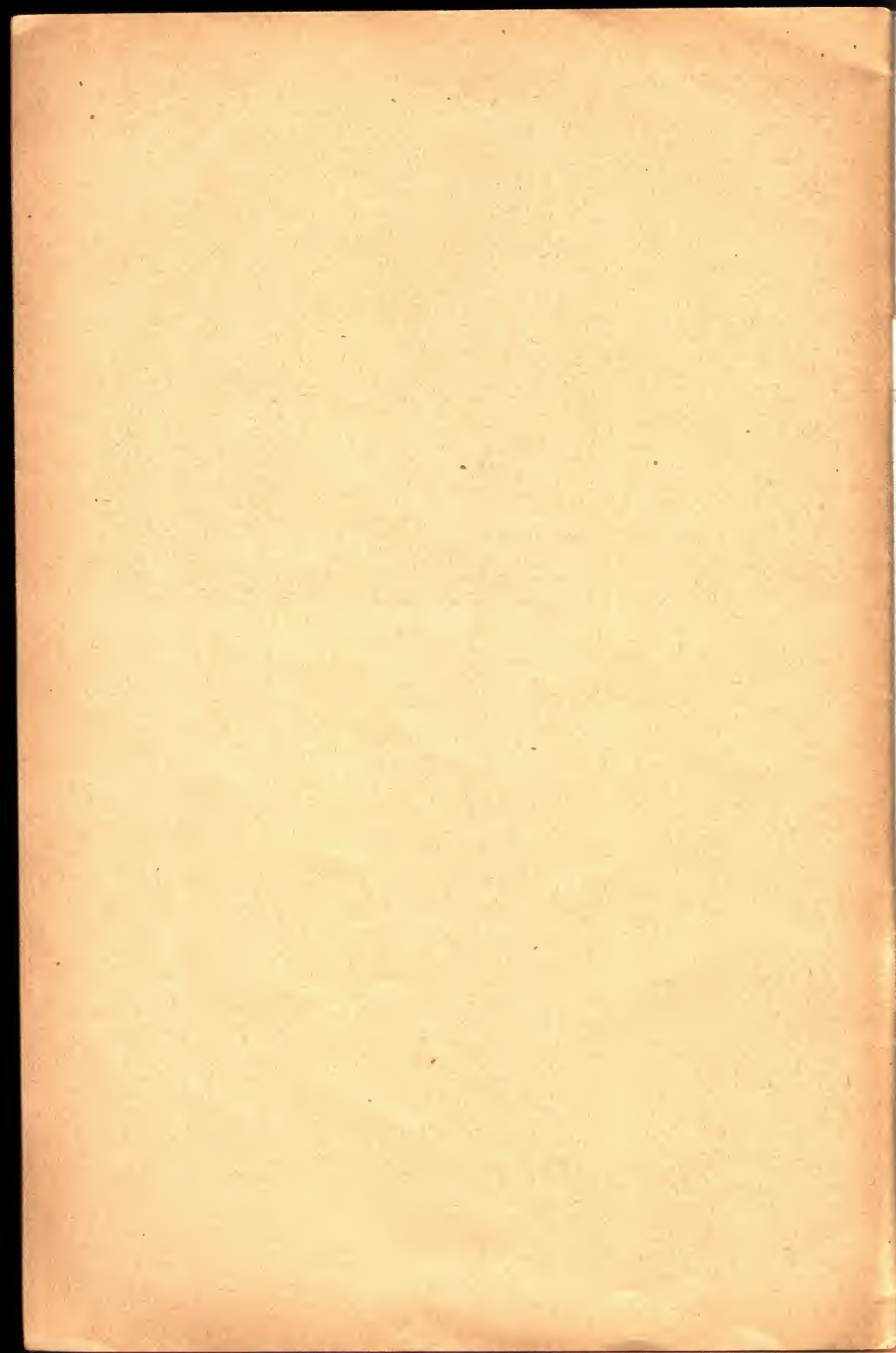
mental stage. In my experience it rusted badly about the chaff, but the straw was quite free from infection.

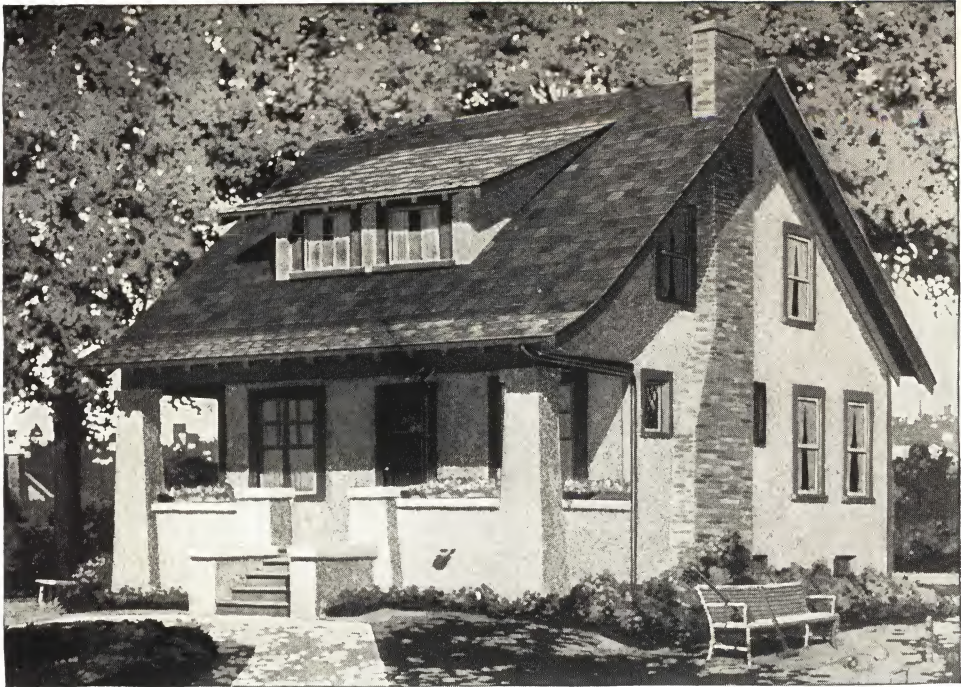
Thus the problem of rust prevention, so far as the individual grower of bread wheat is concerned, is one of dodging or avoiding the pest by early seeding of early maturing varieties sown in spring or by the use of Kanred Winter wheat if his conditions permit a winter wheat to survive often enough to pay;—and he can see to it that any barberries on his farm are eliminated.

Henry C. Gilbert is State Leader of Barberry Eradication for South Dakota. Address, Brookings, S. D.









One of many illustrations shown in American Steel & Wire Company's book of Stucco Houses, sent free on request

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